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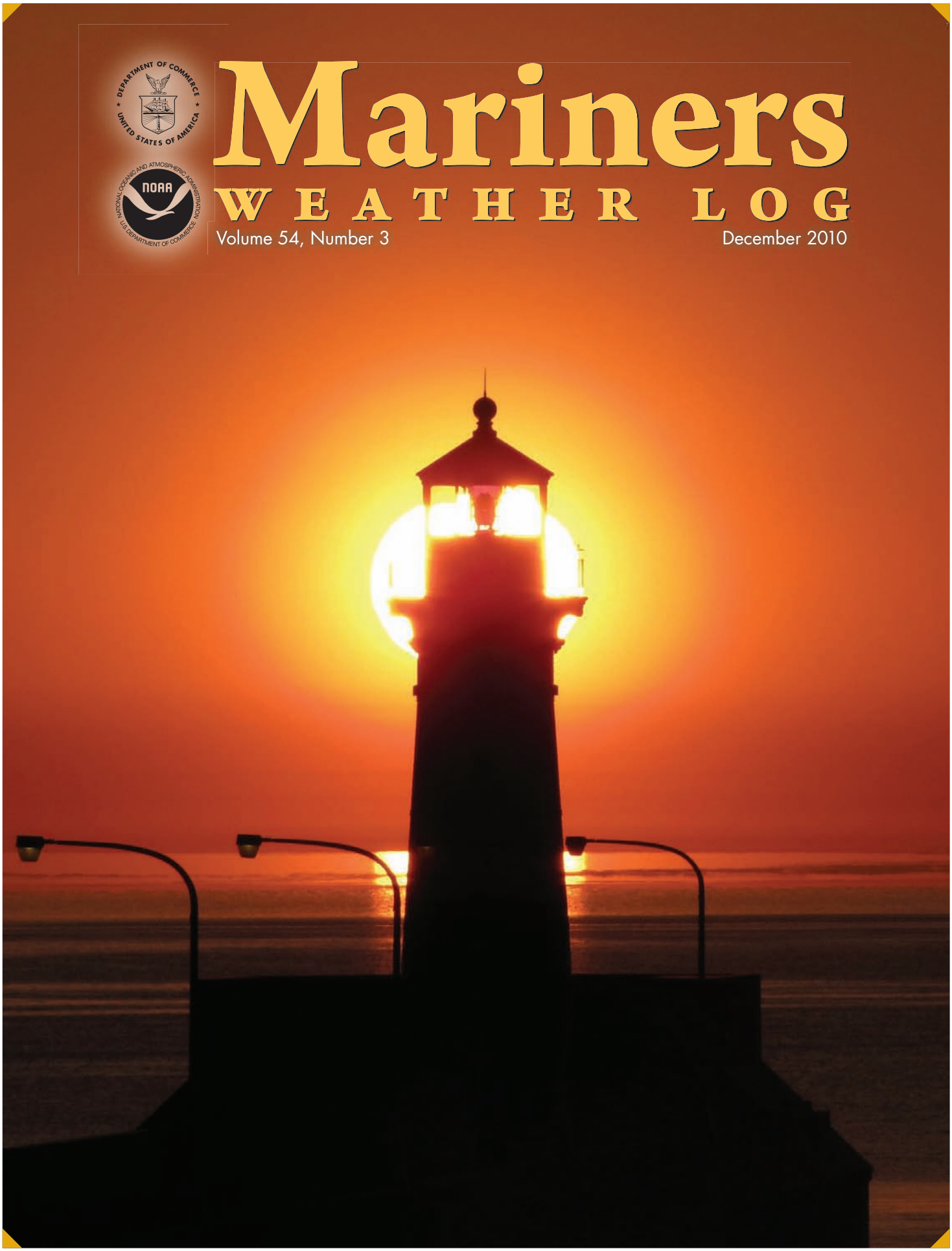

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Marine Dissemination
http://www.nws.noaa.gov/om/marine/home.htm

U.S. Coast Guard Navigation Center
http://www.navcen.uscg.gov/marcomms/

See these Web pages for further links.

From the Editor

John Wasserman

Greetings shipmates and friends. Thank you once again for picking up this issue of the Mariners Weather Log!

It is with a great deal of sadness that I must report the passing of my dear friend Robert Luke. He was a great colleague and friend to all who knew him, please read his story on page 2.

The US VOS program said goodbye to our Seattle PMO Pat Brandow. Pat retired and is embarking on a new chapter of his life. He has been a tremendous asset to the US VOS program and his expertise will be missed greatly.

I have deemed this issue the "Awards Issue" we love to recognize our ships for their outstanding efforts and this issue is proof positive of what a great job our ships are doing for the program.

Speaking of awards, I think some clarification is in order. This is for those ships that participate in the "leagues" that we have set up. When we do the totals for the month and the year, the system is designed to count 1 observation, per ship, per hour. There are several reasons for this. We have seen, on more than one occasion, ships that will transmit the same observation several times during the hour. Please keep in mind that we do like to see observations come in when significant weather changes occur, however, there is no need to retransmit the observation (several times in the same hour) with no change in the data transmitted or only a change in ships position.

Well that's about enough of my ramblings and musings. Please enjoy this issue of the Mariners Weather Log.

John

On the cover:
Sunrise over Lake Superior.
Photo courtesy of
Barb Fuler

Mariners WEATHER LOG

Departments:

Marine Weather Review

VOS Program

In Memoriam: Robert Luke

By John Wasserman

An unexpected tragedy struck the US VOS family when Robert Luke, the US Program Lead, passed away Friday, October 22, 2010. He suffered a heart attack at just 50 years of age, an event that caught us all by surprise and has left us in a state of disbelief.

"Luke" was born in Waukesha, WI on May 5th 1960, moved to Cincinnati and graduated from Northwest High School in 1978. He immediately enlisted in the Navy, and served his country proudly for 21 years, retiring as a Chief Aerographer's Mate.

During his Naval career, Luke served in various locations including: Misawa, Japan; Brunswick, Maine; Port Hueneme, California; Operation Deep Freeze Winter Over Party at McMurdo Station, Antarctica; Christchurch, New Zealand; USS Coral Sea; Barbers Point, Hawaii; USS Kitty Hawk; USS George Washington; and the Naval Oceanographic Office (NAVOCEANO).

During his tour in Barbers Point, Hawaii he met his wife, Pam. They married in 1988 and had two children, Caleb (21) and Sierra (18) who both attend the University Southern Mississippi.

Luke started his tenure with the US VOS program in 2001. His first position was as Operations Manager and then quickly ascended to the Program Manager position. He was instrumental in the development of a brand new web-based database which has helped to bridge the gap between US and International VOS programs.

Always thinking of others before himself, Luke spent countless hours implementing innovative fundraising events for charities and non-profit organizations throughout South Mississippi.

SPECIAL NOTE

Luke was a longtime friend, shipmate and coworker of mine. He was a consummate professional who always put others before himself. He was a kind, warm, light-hearted, caring individual. He was a cherished friend and shipmate to everyone he met. He will be sorely missed. ⚓

Seattle PMO Retires After 44 Years

By Robert Luke

Pat Brandow, Seattle PMO

On September 30, 2010, Pat Brandow, the Port Meteorological Officer in Seattle, Washington, retired after a long and distinguished career serving his country in both the United States Navy and NOAA's National Weather Service. His combined military and federal service totals an impressive 44 years.

Pat joined the U.S. Navy in December 1966. He served during the Vietnam War on the USS Kearsarge (CVS-33) (1967-68) before training as an Aereographers Mate (AG) (Weather Observer) at the Naval Training Center in Lakehurst, New Jersey (1968). Upon graduation, Pat was assigned to the Naval Air Station at Atsugi, Japan (1968-1971), and subsequently to Naval Air Station Saufley Field in Pensacola, FL (1971-1973). Following completion of Advanced Forecaster Training at Lakehurst, Pat had several assignments as a Navy forecaster from 1974 through 1983, including aboard the USS Midway (CV-41), at Naval Air Station Cubi Point in the Philippines, and at Naval Air Station Alvin Calendar in Belle Chase, Louisiana. Pat's final military assignment was at the Naval Postgraduate School in Monterey, California, where he served as an instructor in the Geophysics Technical Readiness Laboratory. After 20 years of dedicated service and achieving the rank of Chief Petty Officer, Pat retired from the U.S. Navy in 1986.

Pat didn't remain idle for long, however. In September 1986, he began a second career in weather, this time with NOAA's National Weather Service. For his first 10 years with NWS, he was assigned as a Meteorological Technician at the Forecast Office in Seattle, Washington, working the Public Service desk. In January 1995, Pat was selected as the new NWS Port Meteorological Officer (PMO) in Seattle. His new duties included recruiting new vessels into the "Voluntary Observing Ship" (VOS) and serving the needs of vessels already in the VOS Program. For the next 14 years, Pat served in one of the nation's busiest commercial shipping areas, responsible for Ports in Seattle, Tacoma, Portland (Oregon), and numerous smaller ports in western Washington and Oregon. ⚓

Shipwreck: Edmund Fitzgerald

By Skip Gillam
Vinland, Ontario, Canada

Edmund Fitzgerald

This fall marks the 35th anniversary of the loss of the Great Lakes ore carrier *Edmund Fitzgerald*. The ship disappeared in a November gale on Lake Superior. All 29 sailors on board were lost.

The ship's demise has been well documented in books, articles, films and song. What is not conclusively known it the reason why the ship went down. Recent evidence seems to lead to the conclusion that it was overwhelmed by a rogue wave.

The *Edmund Fitzgerald* was a product of the Great Lakes Engineering Works, River Rouge, MI. It was launched on June 7, 1958, and entered service several months later, on September 22, departing for Silver Bay, MN to load iron ore for Toledo, OH.

At 729 feet, 3 inches in overall length by 75 feet at the beam, this was the largest ship on the Great Lakes at that time. Power was supplied by a Westinghouse steam turbine engine that generated 7,500 shaft horsepower with steam from a pair of coal-fired water tube boilers.

The 13,632 gross ton carrier set several cargo records. It loaded 22,475 gross tons out of Silver Bay on June 18, 1960, to set a new standard that was surpassed on numerous occasions. It was the first laker to top 26,000 tons, the first over 27, 000 tons and, in 1968, the first to carry 30,000 tons. In 1968 the *Edmund Fitzgerald* moved 1,358,074 tons of cargo through the Soo Locks setting a new single season record. The ship is shown on July 4, 1968, in a photo by Rev. Peter J. Van der Linden.

The *Edmund Fitzgerald* was operated as part of the Columbia Transportation Co. fleet but was actually owned, as an investment, by the Northwestern Mutual Life Insurance Company.

On May 1, 1970, the *Edmund Fitzgerald* was in a collision with the Canadian steamer *Hochelaga* at the mouth of the Detroit River. Both vessels were downbound with cargo when the accident occurred and the *Edmund Fitzgerald* lost an anchor in the confrontation.

During the winter of 1971-1972, the boilers were fully automated and converted to burn oil rather than coal.

After loading the final cargo of ore at Superior, WI, *Edmund Fitzgerald* headed across Lake Superior on November 10, 1975. Due to the gale warnings, the Captain took a more sheltered course following the north shore and was almost to the quieter waters of Whitefish Bay when the ship went down. It simply disappeared from the radar screen of nearby vessels without any explanation. All on board were lost in the sudden sinking and no bodies were ever found.

The hull was subsequently located by a robot camera and was found broken apart. The stern rests upside down in 530 feet of water while the heavily damaged bow section is nearby and upright on the bottom.

Some investigators theorized that the ship may have struck bottom passing over a shoal area and was holed. Others suspect water leaked through the hatch covers. A recent investigation however, suggests that the ship was overwhelmed by a rogue wave and could not recover.

Two life boats broke free and are on display at the Valley Camp Museum at Sault Ste. Marie, MI. The damage, shown in a photo by Norm Wood on September 9, 1991, was believed to have been inflicted by the thrashing propeller striking the lifeboat as the freighter sank.

Had the *Edmund Fitzgerald* survived the now famous November Gale, it is difficult to determine its future. The fleet that operated it no longer exist as a Great Lakes shipping company but, if the vessel had been converted to a self-unloader, as a number of fleetmates had, it may be still plying the occasionally tumultuous waters of the Great Lakes for another owner. ⚓

Lifeboat from the Edmund Fitzgerald

The PMO's Corner

Rob Niemeyer PMO Jacksonville

This issue's topic is National Weather Service Products Available Via E-Mail (FTPMAIL).

Throughout many years as a Naval Meteorologist, many hours at sea were devoted to tuning the radio facsimile equipment and dealing with the frustrations of either not being able to acquire an adequate frequency or perhaps having to wait for a specific chart to hit the schedule. Many of today's vessels have been equipped with broadband, having the ability to access various websites while at sea and are not solely reliant on Radio Facsimile chart. Regardless of how you acquire your weather charts, you should have a back up system for obtaining your products.

For over 10 years, the National Weather Service has been providing a service to acquire TPC/NHC text files & graphic charts available via email through a National Weather Service FTPMAIL server. This service is free and no sign up is required. The FTPMAIL server is intended to allow internet access for mariners and other users who do not have access to the World Wide Web but who are equipped with an e-mail system. Turnaround time is generally under an hour but can be as quick as a few minutes, performance varies widely and receipt can not be guaranteed. The following will provide some basic instructions on how to utilize the FTPMAIL, but you can also refer to your Radio Facsimile Broadcast Schedule publication for detailed instructions located in the appendix.

Weather charts are sent back as an attachment to the e-mail address of the requestor. You will receive an e-mail for each individual chart you request. Responses are sent from the following NWS e-mail server: **ftpmail@ftpmail.nws.noaa.gov**

This is an automated system - ***Correct capitalization for commands, directory and file names are critical.*** The system is case sensitive. Commands are lower case, while most (not all) Chart Id's are upper case.

You can request a single chart, or request multiple charts within a single e-mail request. File size for most weather charts average 35KB but can be as much as 110KB. Satellite imagery is much larger, usually between 150KB to over 250KB.

Chart files are in a compressed TIFF format, which can be viewed, by a number of software programs including Microsoft Internet Explorer. Suggestions for TIFF viewers may be found in the Worldwide Marine Radiofacsimile Broadcast Schedule Manual. Attachments are received in UUencoded form. The majority of modern e-mail systems handle the conversion automatically, other users will need to run the UUdecode program for their particular system. See your system administrator if you have any questions on this topic.

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To begin using the National Weather Service FTPMAIL service, it is recommended to first obtain the FTP "help file". To obtain the "help file" do the following:

Send an e-mail to: **ftpmail@ftpmail.nws.noaa.gov**
Subject line: Put anything you like
Body: **help**

The help file that you receive via email will discuss procedures and methods of obtaining tropical cyclone information along with a listing of available products using this method. In order to get further information on tropical cyclone specific data available via this service, do the following:

1. Send an email to: **ftpmail@ftpmail.nws.noaa.gov**
2. Subject Line: Anything that you like
3. Body of message (case and line sensitive):
   open
   cd fax
   get marine2.txt
   quit

This will generate an email response with a description of tropical cyclone products and file names along with further instructions on obtaining this particular information via the FTPMAIL server.

To request individual charts, send a small script file via e-mail to NWS requesting the desired file(s) as follows:

1. Send an email to: **ftpmail@ftpmail.nws.noaa.gov**
2. Subject Line: Anything that you like
3. Body of Message (case and line sensitive):
   open
   cd fax
   get (Map ID)
   quit

Example:

To obtain the 96HR Wind/Wave Forecast VT00Z 10E-95W (Map ID PJAM98.TIF), the e-mail script would contain the following:

open
cd fax
get PJAM98.TIF
quit

Several charts can be requested within a single e-mail. Each map requested will be sent back as an individual e-mail.

Example:

open
cd fax
get PYEB86.TIF
get PYEA86.TIF
get PWEK11.TIF
get evst99.jpg
quit

Some e-mail systems used by ships do not allow e-mail to be sent directly back to the ship (reply to) unless the sender has an account with the e-mail provider. In addition many ships are set up so they can only receive or download e-mail from a single controlled point, usually at the company or agents office. To have the weather charts sent back to a different e-mail address, in the first line of the script put **reply-to (e-mail address)** where you want the charts to be sent).

Example:

To obtain the 96HR Wind/Wave Forecast VT00Z 10E-95W (Map ID PJAM98.TIF), and have it sent to another e-mail address (xyzcompany@marine.com), the script file would contain the following:

reply-to xyzcompany@marine.com
open
cd fax
get PJAM98.TIF
quit

The FTP E-Mail system was not designed or recommended as the primary source of acquiring meteorological data, however, it is intended to give mariners a good back-up system in the case that your primary methods are not available.

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This article is just a brief description of the FTP E-Mail service. If you need further assistance or details on this service, please do not hesitate to contact your local PMO. ⚓

Mean Circulation Highlights and Climate Anomalies

May through August 2010

By Anthony Artusa, Meteorologist, Climate Operations Branch, Climate Prediction Center NCEP/NWS/NOAA

May-June 2010

The 500 hPa circulation pattern over the Northern Hemisphere during May featured above average heights over the high latitudes, and generally below average heights over most of the mid-latitudes (*Figure 1*). This pattern reflected the negative phase of both the Arctic Oscillation (AO) and the North Atlantic Oscillation (NAO). The negative NAO signal has been very persistent since July 2009. The sea level pressure (SLP) pattern largely mirrors the 500 hPa pattern, and emphasizes the persistent area of lower than normal SLP near Newfoundland (*Figure 2*).

The mid-tropospheric circulation during June 2010 featured considerable zonal symmetry, with above average heights prevailing in the middle latitudes and the polar region, and below-average heights dominating much of the mid-high latitudes around 60N (*Figure 3*). The SLP map reflected a rather weak hemispheric pattern over temperate latitudes, with somewhat stronger anomalies over the polar region (*Figure 4*)

The Tropics

Positive sea surface temperature (SST) anomalies continued to decrease across most of the equatorial Pacific Ocean during May and June 2010. The latest monthly SST indices for the Nino 3.4 region were 0.0C (May) and -0.4C (June), respectively. The oceanic thermocline, measured by the depth of the 20C isotherm, was shallower than average across the central and eastern equatorial Pacific. Atmospheric convection was enhanced over Indonesia, and suppressed across the central equatorial Pacific. Equatorial low level easterly winds remained stronger than average over the western and central Pacific, while the upper-level westerly wind anomalies persisted across the central and eastern Pacific. Collectively, the atmospheric and oceanic anomalies signal the conclusion of this El Nino event (May), and developing La Nina conditions (June).

The 2010 Atlantic hurricane season began with Alex, which formed in the western Caribbean and attained tropical storm intensity before making its first landfall in Belize on June 26, with winds just under 60 kts. After emerging into the Bay of Campeche the following day, it began to restrengthen, making a second landfall several days later as a strong Category 2 hurricane south of Brownsville, TX. In the eastern Pacific, several tropical storms formed early in the season, followed by a category 5 hurricane named Celia. At peak intensity, this powerful hurricane had top winds of 140 kts, and an estimated barometric pressure of 921 hPa.

July-August 2010

The 500 hPa circulation pattern during July 2010 featured above-average heights primarily at middle latitudes, and below-average heights in much of the polar basin (*Figure 5*). Heights were well above average (at least 90 m) over the Gulf of Alaska, Siberia, and northwestern Russia. The sea level pressure and anomaly map in *figure 6* is a reasonable match (sign-wise) to the 500 hPa height anomaly map, though the 500 hPa ridging over Siberia was only weakly reflected at the surface.

The month of August featured well above average 500 hPa heights across far northern portions of North America and adjacent portions of the Arctic Ocean, as well as over Greenland and Iceland (*Figure 7*). Above average heights also dominated much of the middle latitude Pacific, and from eastern Europe to central Russia. Relatively modest below average heights were noted over southwestern Canada, the British Isles, and north-central Russia. Interestingly, the SLP anomaly map (*Figure 8*) shows below average SLP from Hudson Bay to Lake Winnipeg, which is very weakly reflected in the 500 hPa height anomaly pattern.

The Tropics

Negative SST anomalies continued to strengthen across the equatorial Pacific Ocean during July and August 2010. The latest monthly SST indices for the Nino 3.4 region continued to fall, registering -0.9C in July and -1.2C in August. In fact, by August, all of the monthly Nino indices were at or below -1.0C. The oceanic thermocline (measured by the depth of the 20C isotherm) was shallower than average across the central and eastern equatorial Pacific, with sub-surface temperatures reaching 1C to 5C below average in the region. Deep cloudiness and thunderstorm activity near the equator was enhanced over Indonesia, and suppressed over the western and central equatorial Pacific. Equatorial low-level easterly trade winds and upper-level westerly winds remained stronger than average over the western and central Pacific. These atmospheric and oceanic anomalies reflect developing and strengthening La Nina conditions.

Several tropical storms formed over the Atlantic basin in July and early August, but it was not until the latter half of August that the second and third hurricanes of the season developed. Hurricanes Danielle and Earl both reached category 4 intensity. Danielle,

the first of the Cape Verde-type storms, remained well east of any land areas, with top sustained winds of 120 kts. Hurricane Earl was several days behind Danielle, and crossed the Atlantic at lower latitudes than its predecessor. In the first few days of September, Earl would brush past Cape Hatteras, remain off the middle and northern Atlantic coasts, and eventually make landfall in Nova Scotia. Both Nova Scotia and Prince Edward Island experienced many uprooted trees and power outages from this hurricane. ⚓

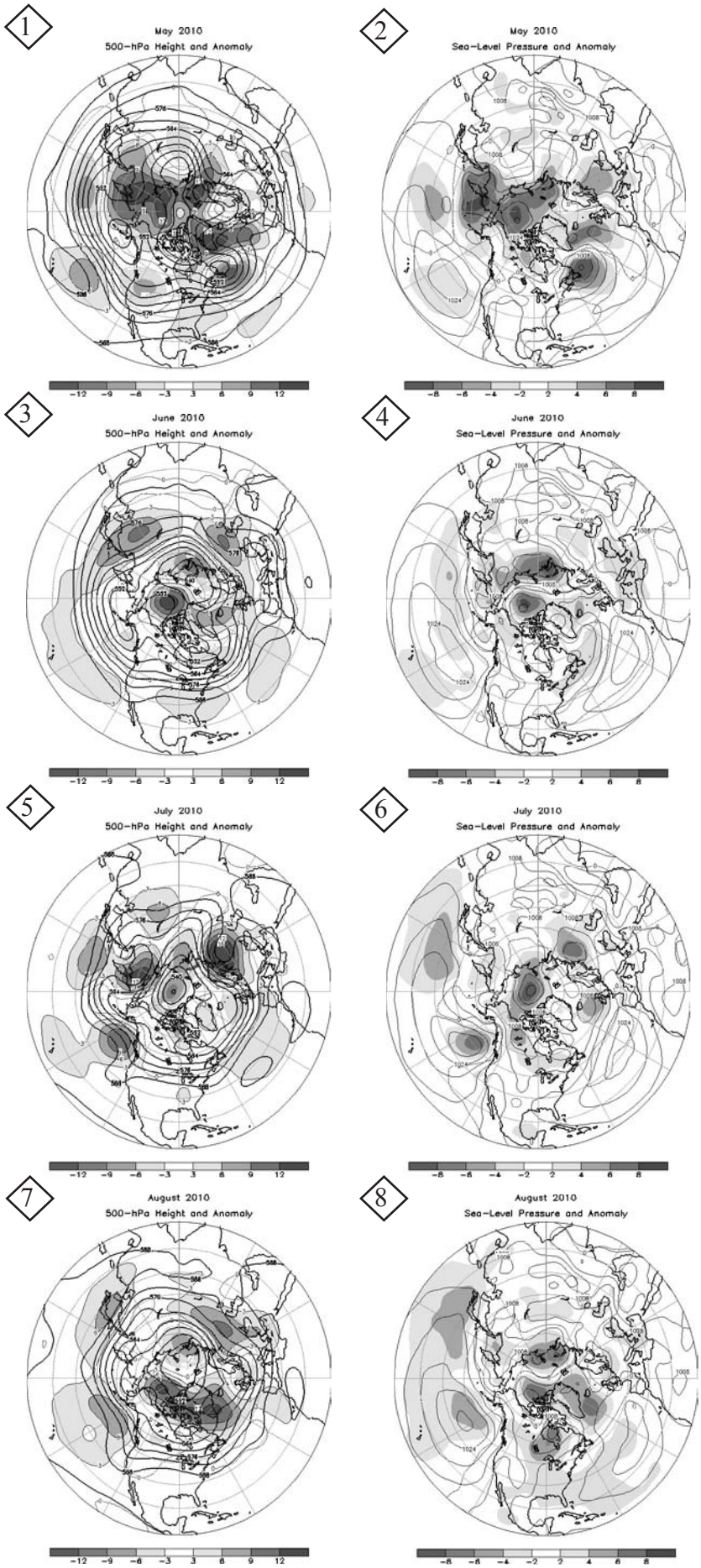
References

1. Climate Diagnostics Bulletin

(http://www.cpc.ncep.noaa.gov/products/CDB/CDB_Archive_html/bulletin_022010/Extratropics/extratropics.shtml)

2. Climate Diagnostics Bulletin

(http://www.cpc.ncep.noaa.gov/products/CDB/CDB_Archive_html/bulletin_022010/Extratropics/extratropics.shtml)



Figures 1,3,5,7
Northern Hemisphere mean and anomalous 500-hPa geopotential height (CDAS/Reanalysis). Mean heights are denoted by solid contours drawn at an interval of 6 dam. Anomaly contour interval is indicated by shading. Anomalies are calculated as departures from the 1979-1995 base period monthly means.

Figures 2,4,6,8
Northern Hemisphere mean and anomalous sea level pressure (CDAS/Reanalysis). Mean values are denoted by solid contours drawn at an interval of 4 hPa. Anomaly contour interval is indicated by shading. Anomalies are calculated as departures from the 1979-1995 base period monthly means.

Marine Weather Review – North Atlantic Area

May through August 2010

By George P. Bancroft
Ocean Forecast Branch, Ocean Prediction Center, Camp Springs, MD
NOAA National Center for Environmental Prediction

Introduction

The period of May to August 2009 includes the late spring and summer months. Although cyclonic activity normally decreases during the period through July, the North Atlantic continued to produce cyclones with storm force winds during this period with May being most active. Although there was some drop off in frequency of such cyclones during the summer months, the first half of July produced two intense cyclones in the northern waters with central pressures below 970 hPa, and a third almost as intense. Unlike the same period of 2009, there were no non tropical lows producing hurricane force winds. The last half of July and first half of August were relatively quiet, followed by increasing activity in late August as fall approached. Most of the lows originated near the Canadian or northeast U.S. coasts and intensified as they moved northeast or east out over the North Atlantic toward the Greenland or northwestern Europe, except in May when blocking high pressure caused then to stall or move erratically off eastern Canada.

Two tropical systems affected OPC's marine area of responsibility north of 31N. In early August weakening Tropical Storm Colin affected waters southwest of Bermuda. A slowly weakening Hurricane Danielle passed well east of Bermuda and became extratropical at the end of August.

Tropical Activity

Tropical Storm Colin: Tropical Storm Colin passed near 31N 66W at 0900 UTC August 8 with maximum sustained winds of 35 kts with gusts to 45 kts but was downgraded to a depression the same morning, with dissipation following late on the 8th near 33N 66W.

Hurricane Danielle: Formerly a major hurricane south of OPC's waters, Danielle moved north into OPC's southwestern waters near 59W as a weakening hurricane on the evening of August 28 with maximum sustained winds of 90 kts with gusts to 110 kts, Category 2 on the Saffir-Simpson scale of intensity (Reference 1). The cyclone made a gradual turn toward the east around the subtropical ridge and weakened to a tropical storm near 41N 49W at 2100 UTC on the 30th with maximum sustained winds of 60 kts with gusts to 75 kts. The cyclone then merged with a nearby frontal zone three hours later and became post tropical (or extratropical) Danielle. *Figure 1* depicts this transition of Danielle to an extratropical storm (second part of *Figure 1*). *Figure 2* is a satellite image taken while Danielle was still classified as a hurricane but undergoing extratropical transition. It retains some circular cloud structure around the center (40N 52W) with possible convection to the northwest but is approaching nearby frontal cloud bands. *Figure 3* shows winds around post tropical Danielle about thirteen hours after completion of extratropical transition. Given that ASCAT winds have low biases that increase at higher wind speeds, the appearance of southwest winds as high as 45 kts near the center supports classification of the cyclone as a storm force low. Danielle then turned more toward the northeast and weakened to a gale by the end of the month. High pressure over Europe and a larger cyclone to the north then turned Danielle to the north toward Greenland, where it dissipated late on September 3.

Other Significant Events of the Period

North Atlantic Storm, May 4-5: The month of May began with a developing low pressure system passing east across the Canadian Maritime Provinces and becoming a storm force low east of Newfoundland early on May 5 (*Figure 4*), when it developed its lowest central pressure of 974 hPa. **Hibernia Platform** (VEP717, 46.7N 48.7W) reported west winds of 55 kts at its 139 m anemometer height (Reference 2) at 0300 UTC May 6. The **Terra Nova** (VCXF, 46.4N 48.4W) with its lower anemometer height of 53 m reported west winds of 40 kts along with 4.5 m seas (14 ft) three hours prior. Among ships, **BATEU07** (47N 59W) reported the highest winds, northwest 45 kts, at 1800 UTC May 4. The **Barrington Island** (C6QK) reported the highest seas of 8.0 m (26 ft) along with a west wind of 35 kts near 43N 41W at 1800 UTC on the 5th. *Figure 5* is an ASCAT image showing wind retrievals of 40 kts on the morning of the 5th which may suggest the cyclone had minimal storm force winds. The cyclone turned toward the northwest on the 5th, blocked by high pressure to the east and northeast, and began to weaken, and became absorbed by another low approaching on a similar track on May 7.

North Atlantic Storms, May 13-16: *Figure 6* depicts the development of two storm force lows over the western waters. The first of these, in the first part of *Figure 6*, originated as a low pressure wave over the mid-Atlantic states early on May 12 and developed

OBSERVATION	POSITION	DATE/TIME (UTC)	WIND	SEA(m/f)
Courage (WDC6907)	40N 51W	15/1000	SW 45	
Undine (SHJC)	47N 46W	15/1800	SE 50	
BATFR43	46N 57W	16/0400	W 45	
A8BZ6	57N 51W	17/0000	NW 40	6.7/22
Hibernia Platform (VEP717)	46.7N 48.7W	15/1500	SE 70 (height 139 m)	
GSF Grand Banks (YJUF7)	46.7N 48W	15/1800	SE 50 (height 82 m)	
Terra Nova (VCXF)	46.4N 48.4W	15/1800	SE 45 (height 53 m)	

Table 1. Selected ship and platform observations taken during the western North Atlantic storm of June 15-16, 2010.

storm force winds when passing south of Newfoundland late on the 13th. The **Training Ship Empire State VI** (KKFW) near 38N 54W reported southwest winds of 45 kts and 7.5 m seas (25 ft) at 0700 UTC on the 14th. The **CL New York** (DPAK) encountered southwest winds of 50 kts and 9.0 m seas (30 ft) near 44N 45W at 0000 UTC on the 15th. A second system of similar intensity originated near the New England coast late on the 14th with the second part of *Figure 6* showing this cyclone southeast of Newfoundland. This cyclone turned north and absorbed the other cyclone near Newfoundland while passing over the Grand Banks over the next twenty-four hours, becoming a large gale. The gale subsequently drifted northeast and weakened over the next few days, dissipating southeast of Greenland by the 21st.

Storm in Davis Strait, May 21-22: A frontal system approaching Greenland from the Labrador Sea on the 21st developed a secondary low on the front by 0600 UTC on the 22nd , with storm force winds near the southwest Greenland coast on the 21st. As the low moved northwest into the Davis Strait on the 22nd the front and associated winds weakened.

North Atlantic Storm, May 24-26: A complex low pressure system moved from Atlantic Canada into the southern Labrador Sea by the 24th as two lows rotating around each other, with the northern low developing storm force winds that day. The system consolidated into a single 987 hPa storm near 51N 47W early on the 25th. Hibernia Platform (VEP717, 46.7N 48.7W) reported northwest winds of 50 kts at 0600 UTC on the 25th, just south of the area of strongest pressure gradient on the west side of the low. To the north the Mary Artica (BATEU00) near 59N 45W reported northeast winds of 43 kts seven hours later. At 2200 UTC May 26 the ship V7RI8 (43N 45W) encountered southwest winds of 45 kts and 4.0 m seas (13 ft). The cyclone lingered in that area for the next twenty-four hours before weakening and moving southwest and becoming absorbed by another low passing to the southeast late on the 28th, to be described next.

North Atlantic Storm, May 29-31: *Figure 7* shows the final forty-eight hours of development of this third most intense low of the period. The storm originated from a frontal wave of low pressure near 41N 44W early on the 28th which absorbed several other lows to its northwest. The ASCAT imagery in *Figure 8* displays winds to 45 kts north and southeast of the storm center at a time when the central pressure was 971 hPa. The Ludwigshafen Express (DILE) reported northwest winds of 40 kts near 52N 36W at 0600 UTC on the 30th. The cyclone then weakened to a gale on the 31st while drifting northeast, and passed north of the area June 2.

Western North Atlantic Storm, June 15-16: The next developing storm is depicted in *Figure 9*, as a frontal wave of low pressure south of Nova Scotia intensified rapidly while absorbing another low over southern Labrador. The central pressure dropped 25 hPa during the twenty-four hour period ending at 1800 UTC on the 15th. The cyclone subsequently drifted southeast and weakened to a gale force low on the 16th, before becoming absorbed by a new low forming in the Labrador Sea late on the 17th. Selected ship and platform reports taken in this event are listed in *Table 1.*

Northeastern Atlantic Storm, June 30-July 2: This cyclone originated as a frontal wave of low pressure near 46N 48W at 1200 UTC on June 29 which tracked northeast and rapidly deepened over the northeastern Atlantic after 0600 UTC on the 30th. The central pressure fell 26 hPa in the twenty-four hour period ending at 0600 UTC July 1, when OPC classified it as a storm force low. Six hours later the central pressure reached 968 hPa near 58N 19W, making this cyclone the most intense of the period, unusual for a July storm. This event was similar in location and intensity to another occurring less than a week later (*Figure 10*). At 0300 UTC July 1 the Arcadia (ZCDN2) near

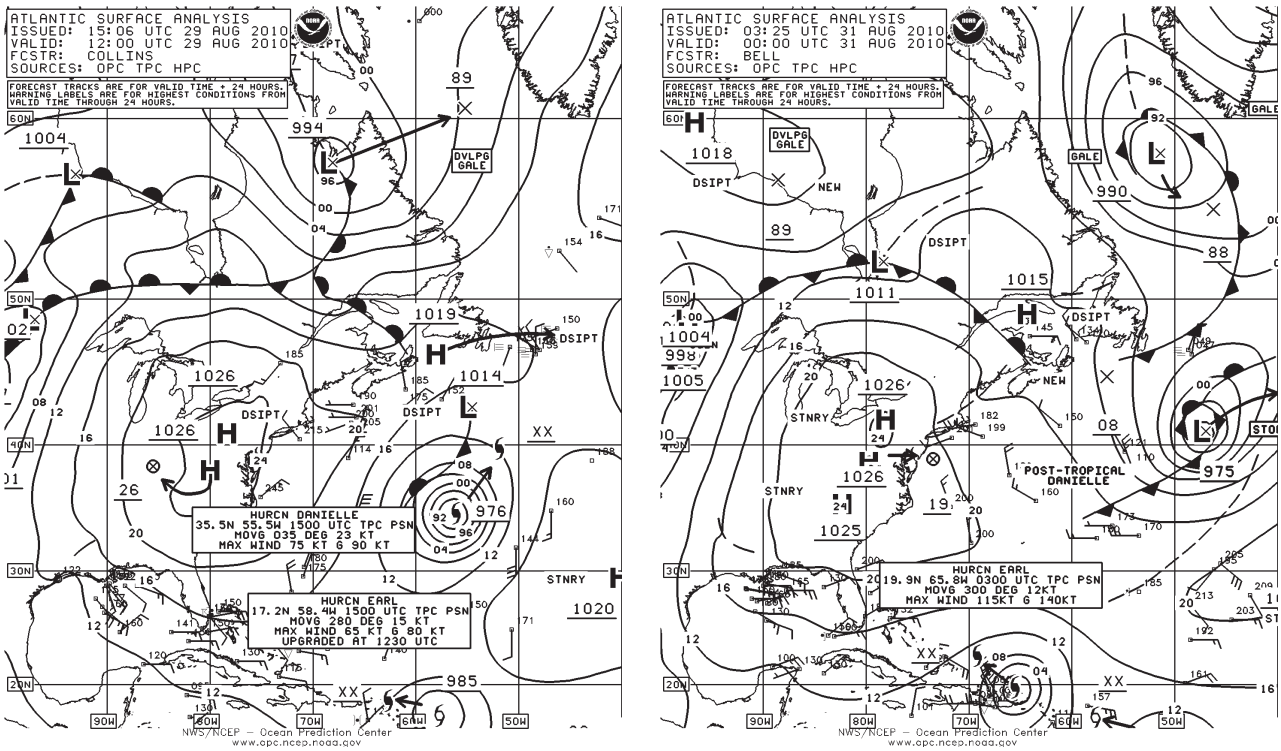


Figure 1. OPC North Atlantic Surface Analysis charts valid 1200 UTC August 29 and 0000 UTC August 31, 2010.

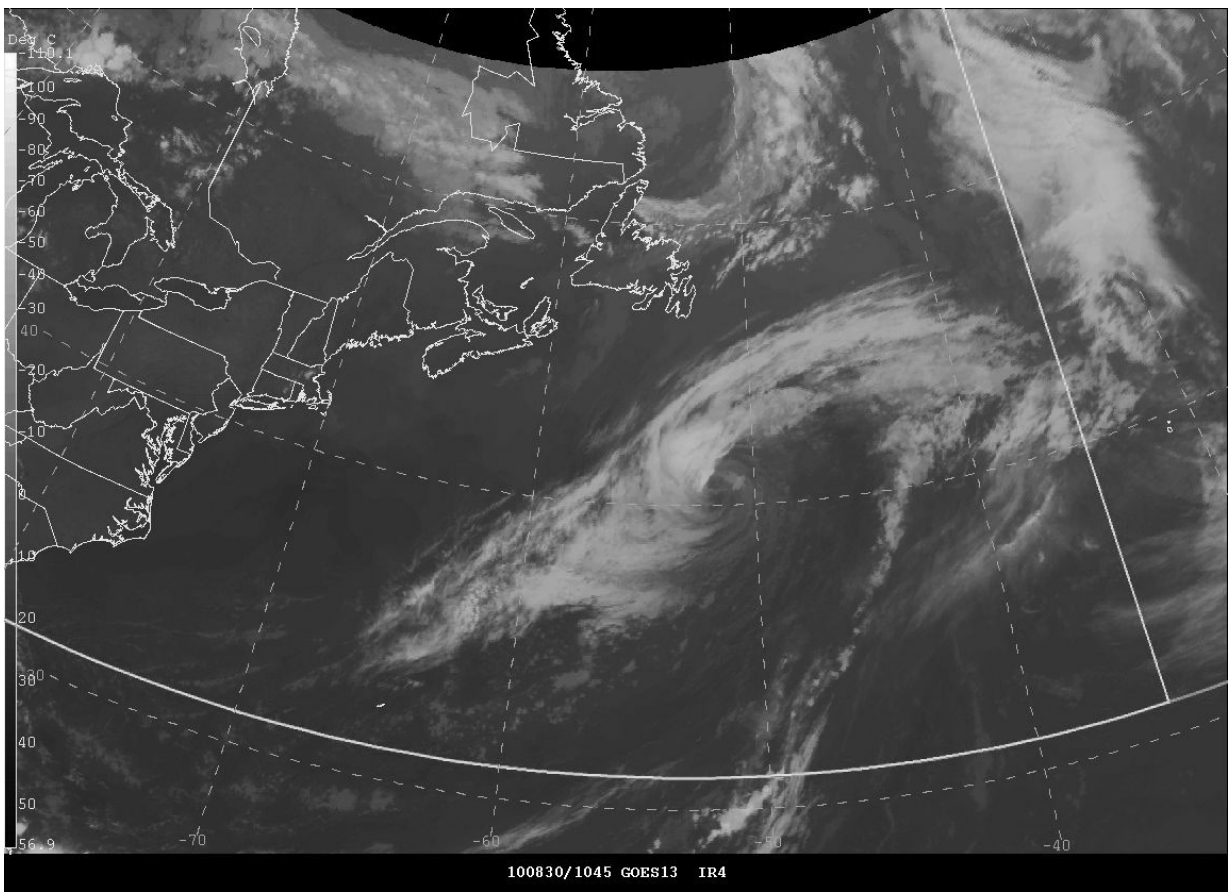


Figure 2. GOES13 infrared satellite image valid 1045 UTC August 30, 2010. The valid time of the image is about 13 hours prior to the valid time of the second part of Figure 1. The satellite senses temperature on a scale from black (warm) to white (cold) in this type of imagery.

62N 23W reported northeast winds of 55 kts and 7.5 m seas (24 ft). The **Leverkusen Express** (DEHY) near 50N 35W encountered 8.5 m seas (28 ft) along with 35 kts northwest winds at 1200 UTC June 30. Other ships in the area reported 40 kts or less. The cyclone subsequently weakened to a gale on July 2 while drifting northeast, before passing northeast of Iceland late on the 3rd.

Northeastern Atlantic Storm, July 6-7: This intense low developed from the merger of a southern frontal wave and a complex low pressure system passing to the north (*Figure 1*0), reaching maximum intensity (central pressure 969 hPa) within twenty-four hours. The central pressure fell 31 hPa during this period using the northern low's initial pressure. Such impressive deepening is reflected in a 500 hPa analysis (*Figure 1*1) showing a short-wave trough and 70 to 85 kts wind maximum or jet stream. More information on use of the 500 hPa chart may be found in Reference 4 (Sienkiewicz and Chesneau, 2008). *Figure 1*2 is a METEOSAT9 infrared satellite image of the storm near the time of maximum intensity, revealing well defined frontal features with cold tops and great vertical extent. *Figure 1*3 provides limited coverage of this system but shows stronger winds on the southeast side of the cyclone, up to 45 kts, strongly suggestive of storm force winds. The **Discovery** (GLNE) near 57N 12W reported southwest winds of 45 kts and 6.7 m seas (22 ft). The buoy 64045 (59.2N 11.7W) reported southwest winds of 35 kts and 10.0 m seas (33 ft) at 0800 UTC on the 7th. Like its predecessor, this cyclone subsequently moved slowly northeast with a weakening trend and passed northeast of Iceland late on the 8th.

Northeastern Alantic Storm of July 11-13: The next developing cyclone took a more west to east track across the North Atlantic and was not as intense, moving off the southern Labrador coast early on July 11 and then becoming a storm with a 995 hPa central pressure near 54N 27W at 1800 UTC on the 12th. It turned toward the southeast and weakened to a gale southwest of Ireland the next day before turning northeast across Great Britain on the 14th and 15th. A new cyclone developed near the English Channel on the 15th and moved northeast, absorbing the other low on July 16. At 0500 UTC on the 12th the **Berge Atlantic** (LAIP5) near 52N 37W reported northwest winds of 45 kts. At 0000 UTC and 0200 UTC July 13 the ship BATFR04 (49.5N 26.5W) reported northwest winds of 48 kts. The **Genco Acheron** (VRCF7) near 50N 29W encountered 9.8 m seas (32 ft) along with 35 kts northwest winds at 0500 UTC on the 13th.

North Atlantic Storm, July 16-17: *Figure 1*4 shows the rapid development of another intense July storm over the northern waters, from the merger of northern and southern lows over a twenty-four hour period. The central pressure fell 23 hPa during this period, and also in an earlier period ending at 0000 UTC on the 16th. The ship VRY03 (54N 49W) reported northeast winds of 55 kts and 6.5 m seas (21 ft) at 1700 UTC on the 16th. The cyclone developed a lowest central pressure of 973 hPa near 55N 44W at 1800 UTC on the 16th then drifted east toward Great Britain with a weakening trend through July 20th. Dissipation followed over northern France on the 23rd.

Northeastern Atlantic Storm, August 20: Low pressure formed on a front near 53N 12W, the northeastward redevelopment of a primary low pressure center 49N 29W at 0000 UTC August 19. This new low lifted north and briefly developed storm force winds southeast of the center by 1800 UTC on the 20th, near 58N 10W. An ASCAT 25 km pass from 1021 UTC that day revealed a small area of winds to 45 kts on the southeast side of a compact cyclone. A weakening trend followed as the cyclone moved into the Norwegian Sea on the 21st.

North Atlantic Storm, August 27-28: The rapid development of this cyclone was farther south than most other events during this period, as high pressure to the north and east blocked its progression. *Figure 1*5 shows the merging of two cyclones to form a storm force low in the second part of *Figure 1*5. The ASCAT wind retrievals in *Figure 1*6 reveal a swath of winds to 45 kts on the southwest and west sides of the cyclone displaced some distance from the center due to presence of an occluded front. These winds support the use of a "storm" label on OPC's surface charts near this time. OPC downgraded the cyclone to a gale force low early on the 28th as it drifted north and weakened. The weakening system turned more northeast on the 29th as the blocking high retreated northeast and dissipated by the end of the month. ⚓

References

1. Saffir-Simpson Scale of Hurricane Intensity: http://www.nhc.noaa.gov/aboutsshs.shtml

2. E-mail communication, Thomas, Bridget, Climate Data and Analysis Section (Environment Canada), October 28, 2008.

3. Sienkiewicz, Joe and Chesneau, Lee, Mariner's Guide to the 500 Millibar Chart, Mariner's *Weather Log, Vol. 52, Number 3, December 2008*.

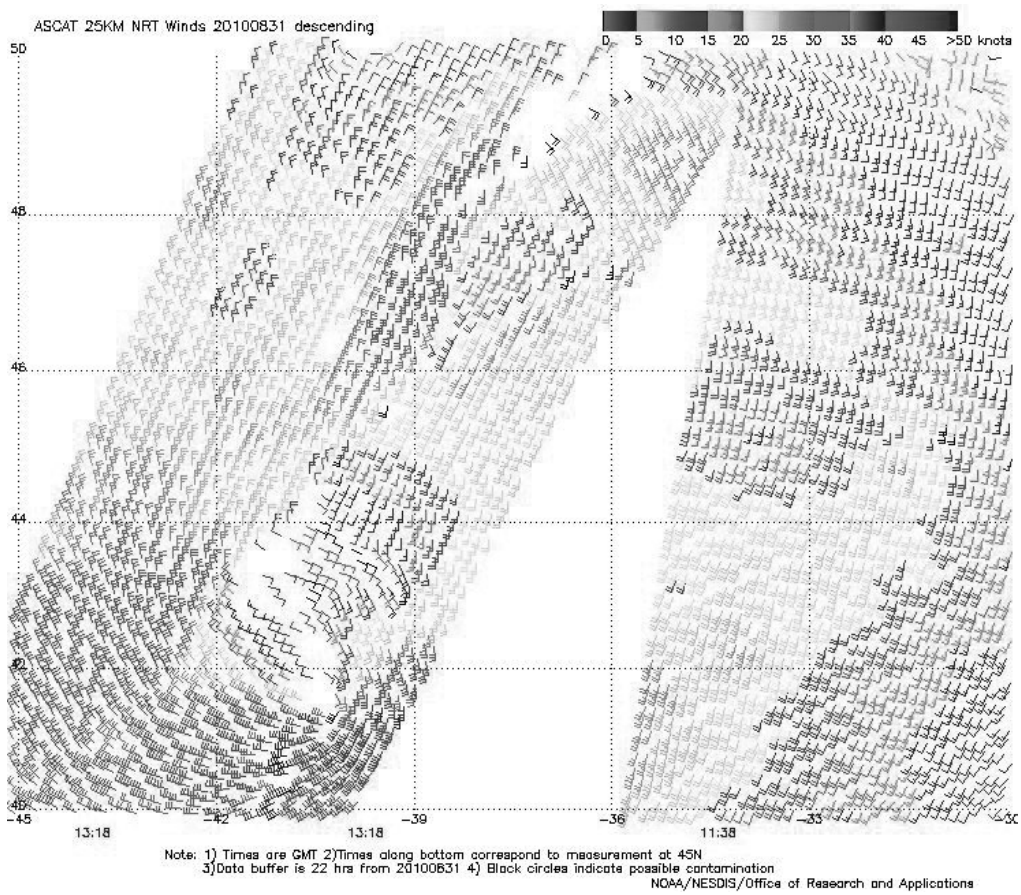


Figure 3. ASCAT (Advanced Scatterometer) image of satellite-sensed winds around post-tropical (or extratropical storm) Danielle shown in the second part of Figure 1. The resolution is 25 km versus 50 km in the coarser resolution version of the imagery. The western portion of the 1138 UTC pass and the eastern portion of the 1318 UTC pass, for August 31, 2010, are shown, with the passes overlapping north of 49N. These times are less than thirteen and one-quarter hours later than the valid time of the second part of Figure 1. The center of the storm appears near 42N 41W in the lower-left side of the image. Image is courtesy of NOAA/NESDIS Center for Satellite Application and Research.

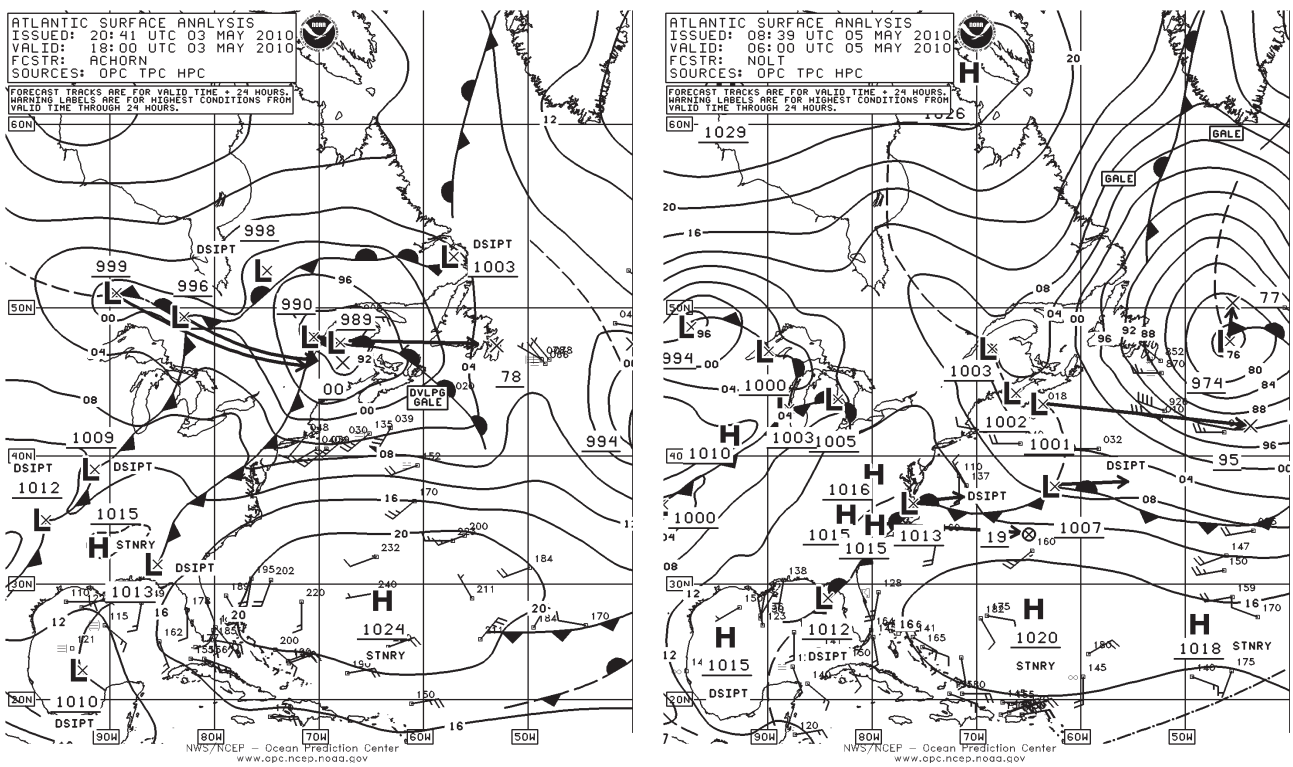


Figure 4. OPC North Atlantic Surface Analysis charts valid 1800 UTC May 3 and 0600 UTC May 5, 2010.

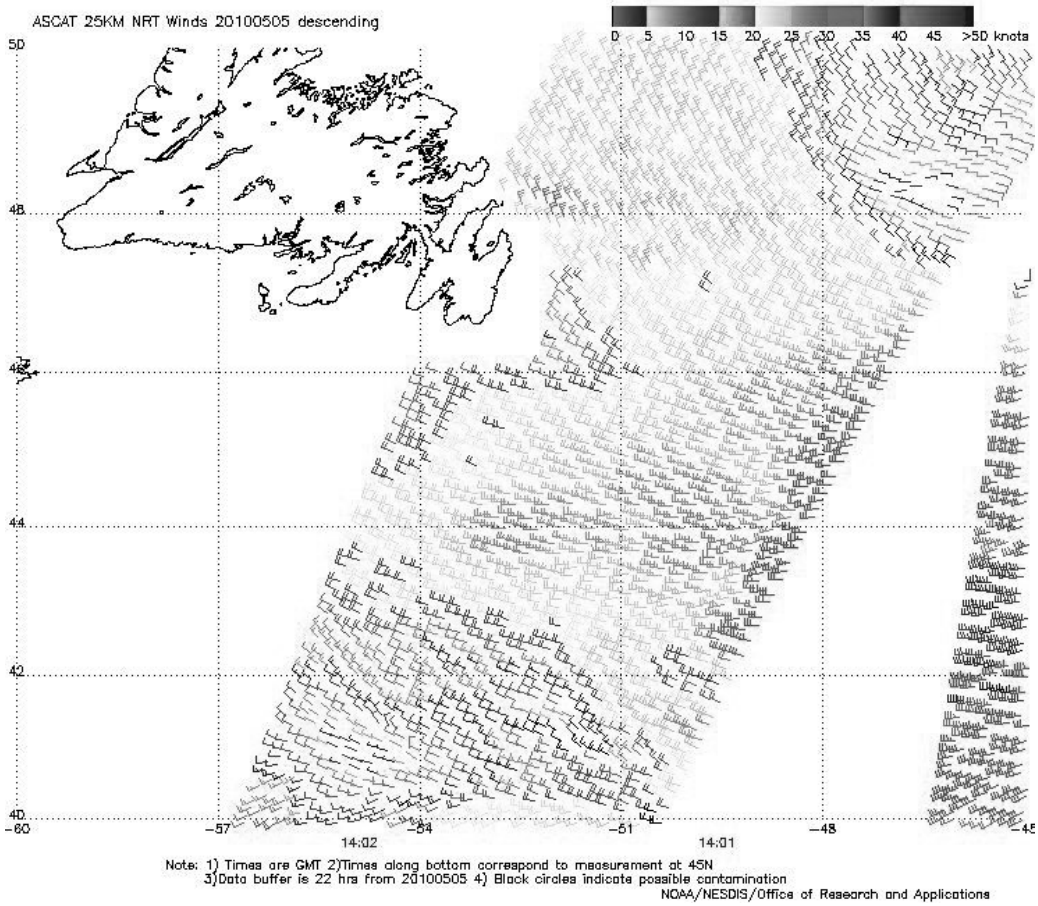


Figure 5. ASCAT 25 km scatterometer image of satellite-sensed winds around the southwest side of the storm east of Newfoundland shown in the second part of Figure 4. The valid time of the pass is 1401 UTC May 5, 2010, or about eight hours later than the valid time of the second part of Figure 4. The island of Newfoundland appears on the upper-left side of the image. Image is courtesy of NOAA/ NESDIS/ Center for Satellite Application and Research.

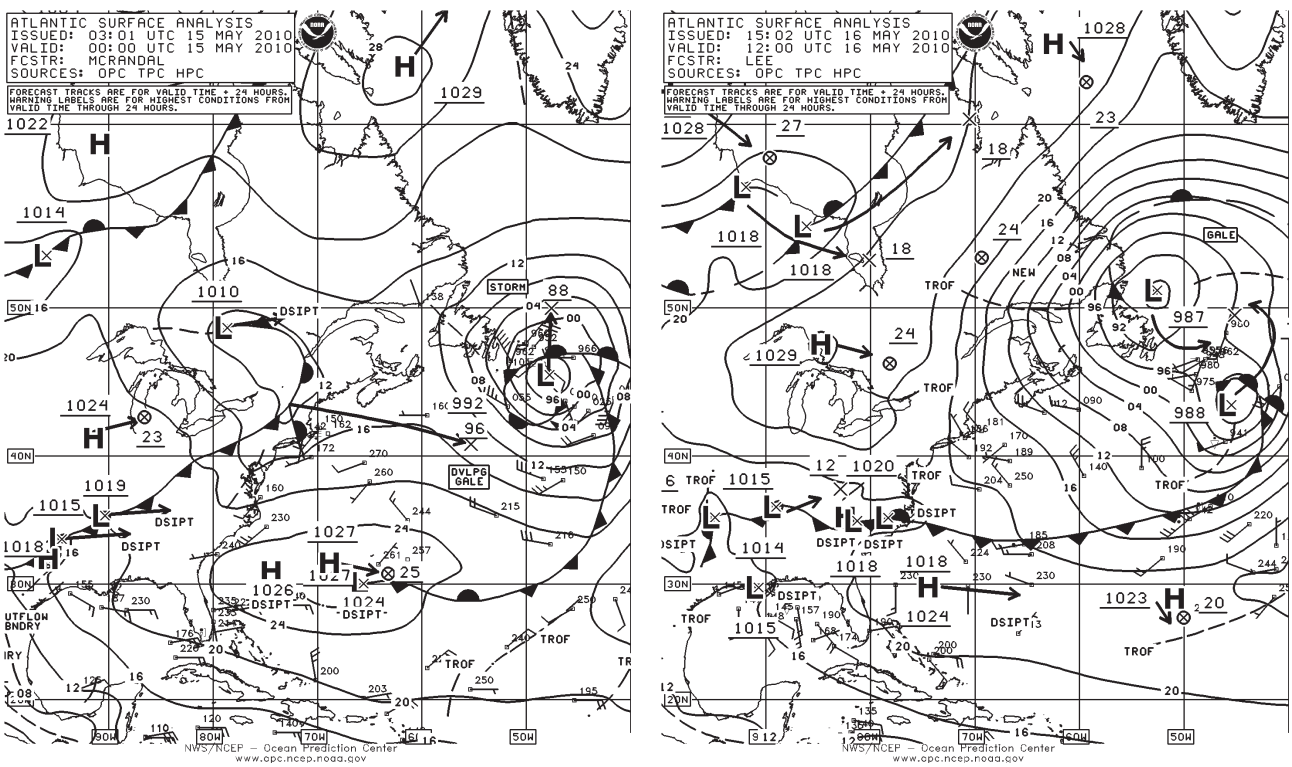


Figure 6. OPC North Atlantic Surface Analysis charts valid 0000 UTC May 15 and 1200 UTC May 16, 2010.

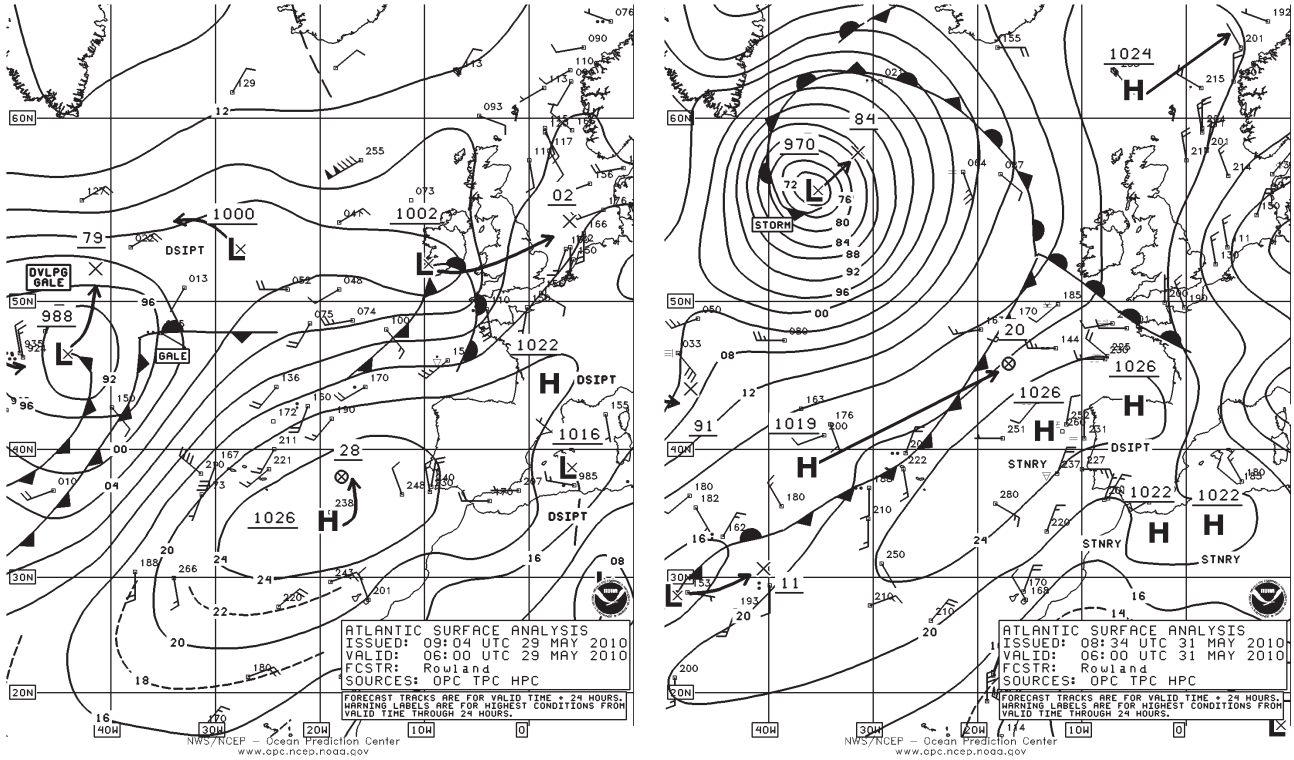


Figure 7. OPC North Atlantic Surface Analysis charts valid 0600 UTC May 29 and 31, 2010.

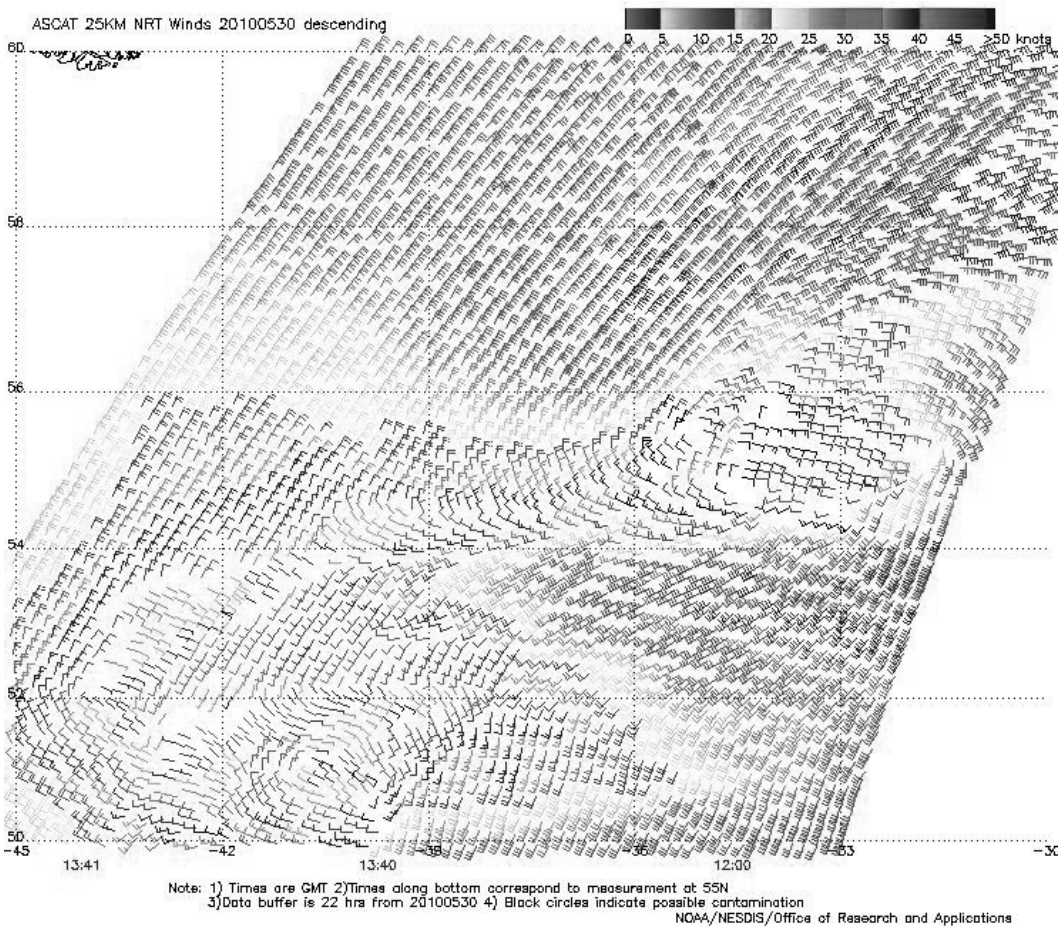


Figure 8. ASCAT 25 km image of satellite sensed winds around the storm shown in the second part of Figure 7. The image shows portions of two passes (1200 UTC and 1340 UTC), about 17-18 hours prior to the valid time of the second part of Figure 7. The southern tip of Greenland appears near the upper-left corner of the image. Image is courtesy of NOAA/ NESDIS/Center for Satellite Application and Research.

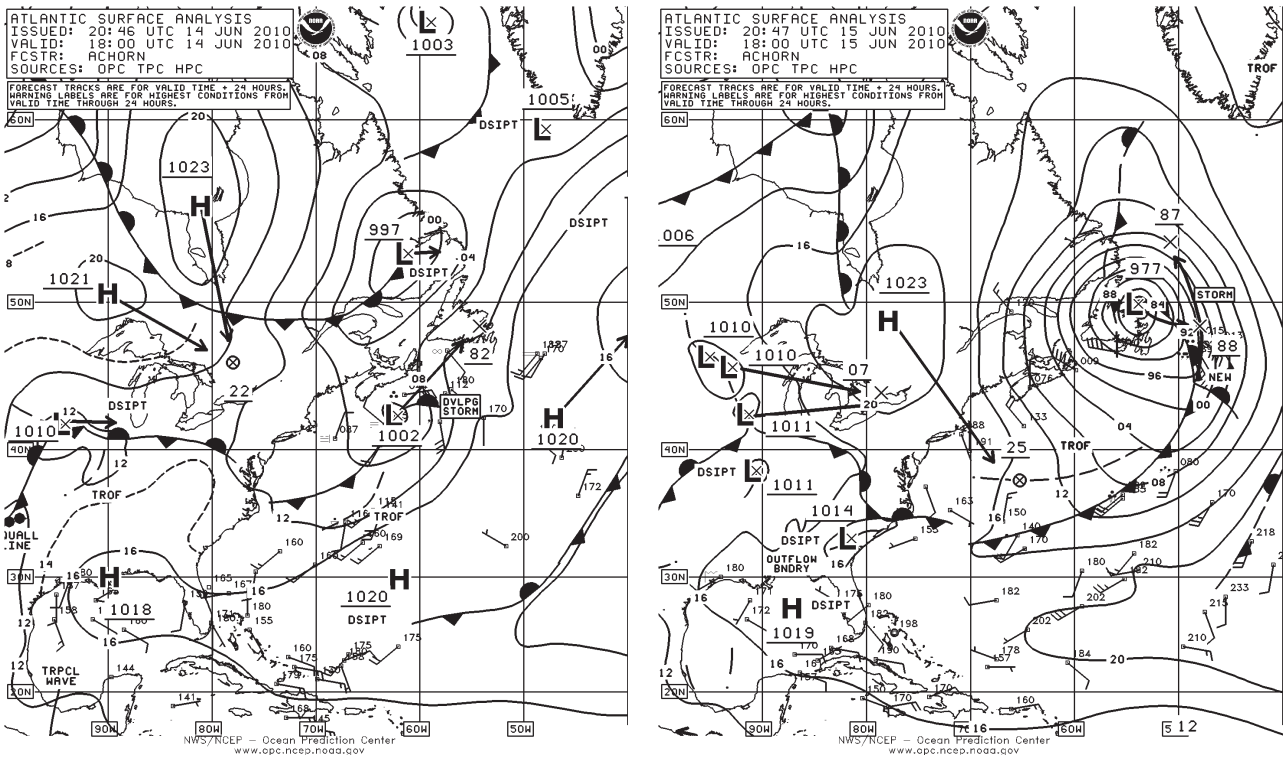


Figure 9. OPC North Atlantic Surface Analysis charts valid 1800 UTC June 14 and 15, 2010.

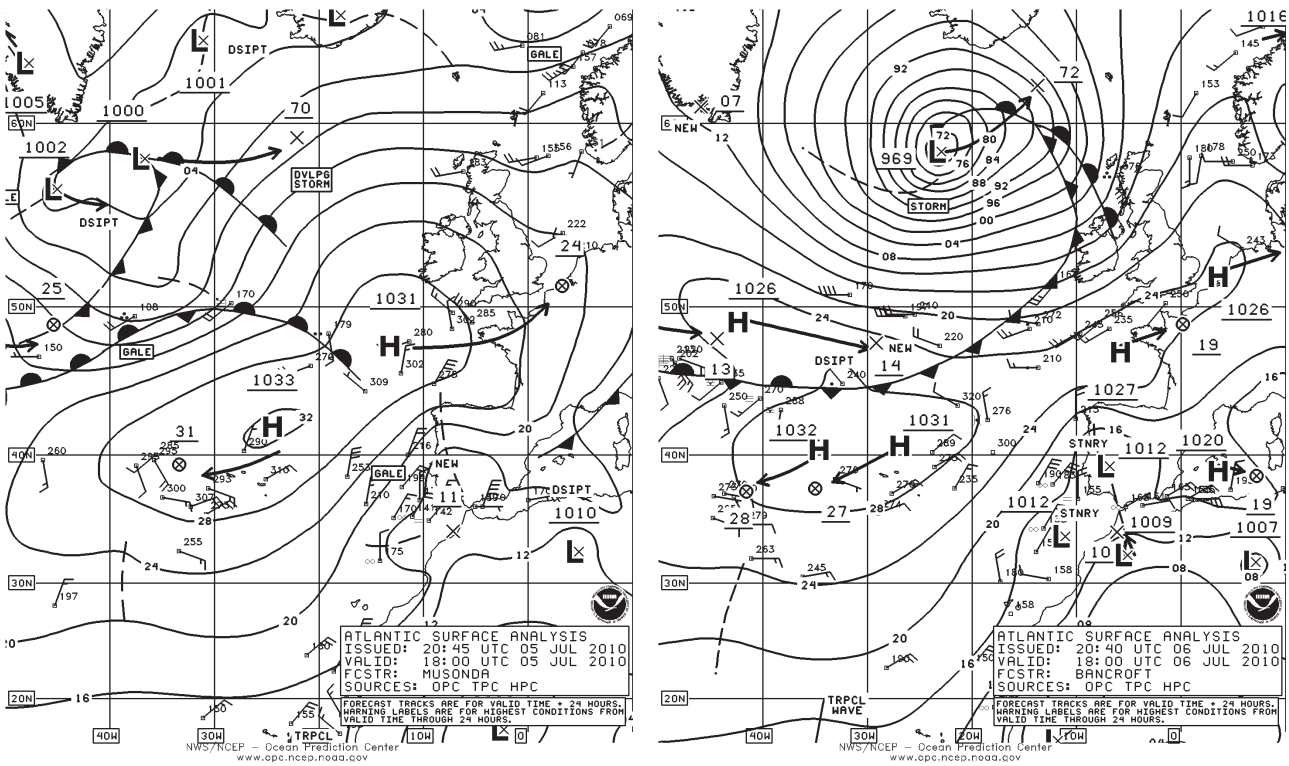


Figure 10. OPC North Atlantic Surface Analysis charts valid 1800 UTC July 5 and 6, 2010.

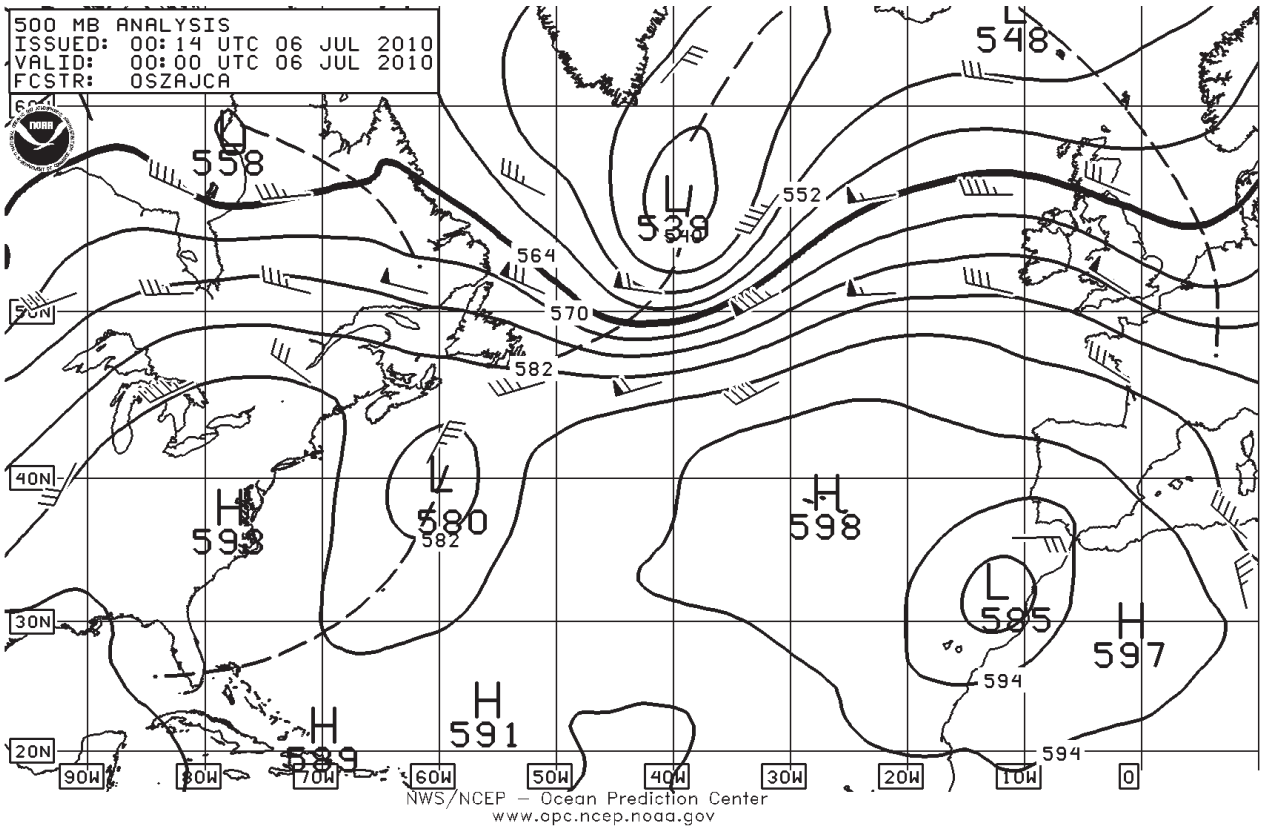


Figure 11. OPC North Atlantic 500 hPa analysis valid 0000 UTC July 6, 2010, during the period of rapid intensification of the North Atlantic low pressure system shown in Figure 10. The chart is computer generated with short-wave troughs (dashed lines) manually added.

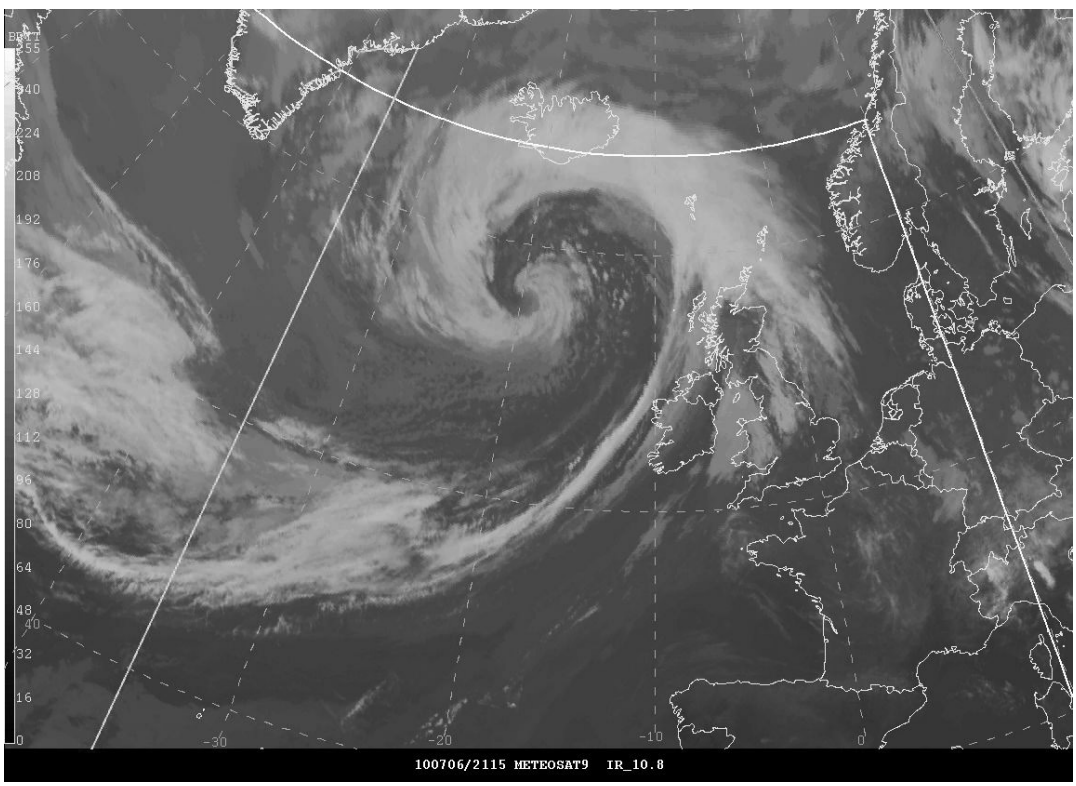


Figure 12. METEOSAT9 infrared satellite image over the northeastern Atlantic valid 2115 UTC July 6, 2010. The valid time of the image approximately three hours later than the valid time of the second part of Figure 10. Satellite senses temperature on a scale from black (warm) to white (cold) in this type of imagery.

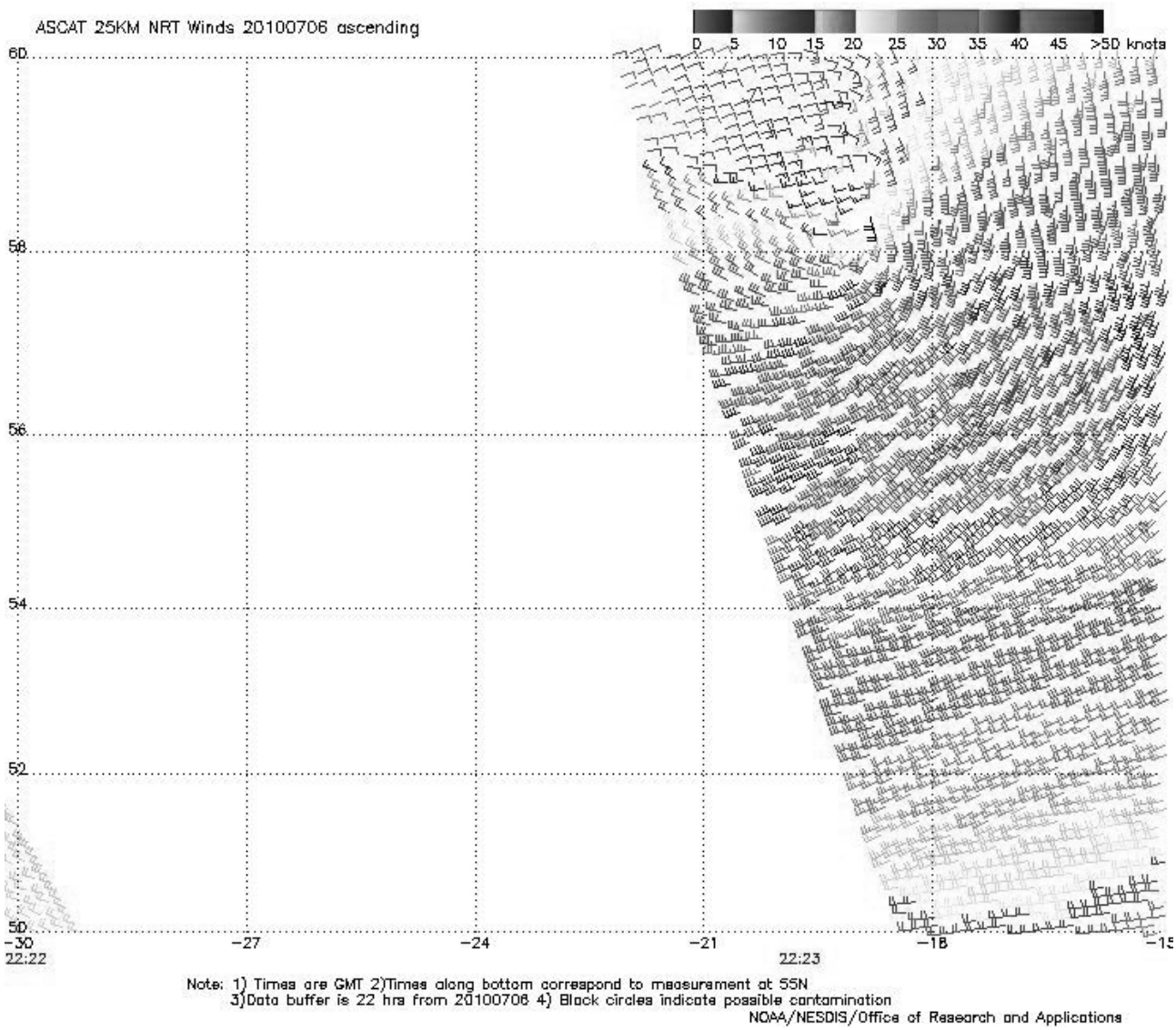


Figure 13.
ASCAT 25 km scatterometer image of satellite-sensed winds around mainly the southeast side of the storm shown in the second part of Figure 10. The valid time of the pass is 2223 UTC July 6, 2010, or about four and one-half hours later than the valid time of the second part of Figure 10. The center of the storm appears near 59N 19W in the upper-right side of the image. Image is courtesy of NOAA/NESDIS/Center for Satellite Application and Research.

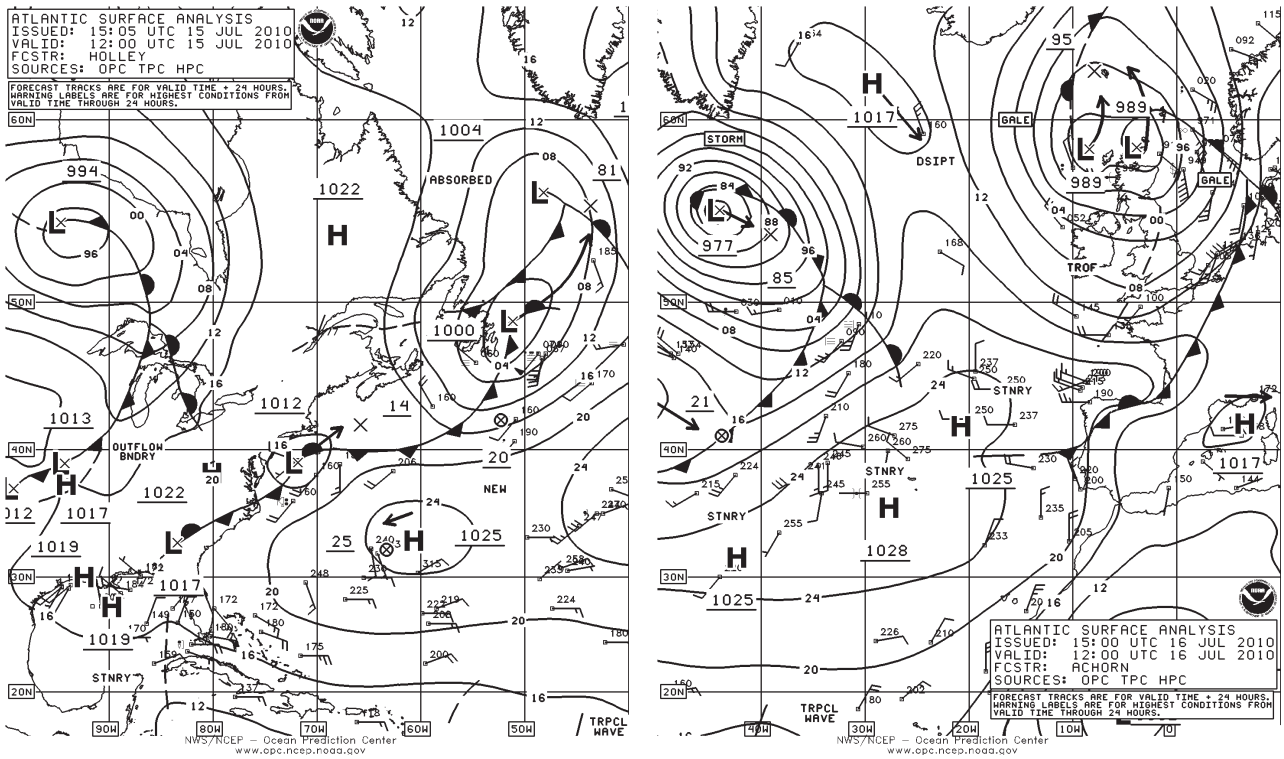


Figure 14. OPC North Atlantic Surface Analysis charts valid 1200 UTC July 15 and 1200 UTC July 16, 2010.

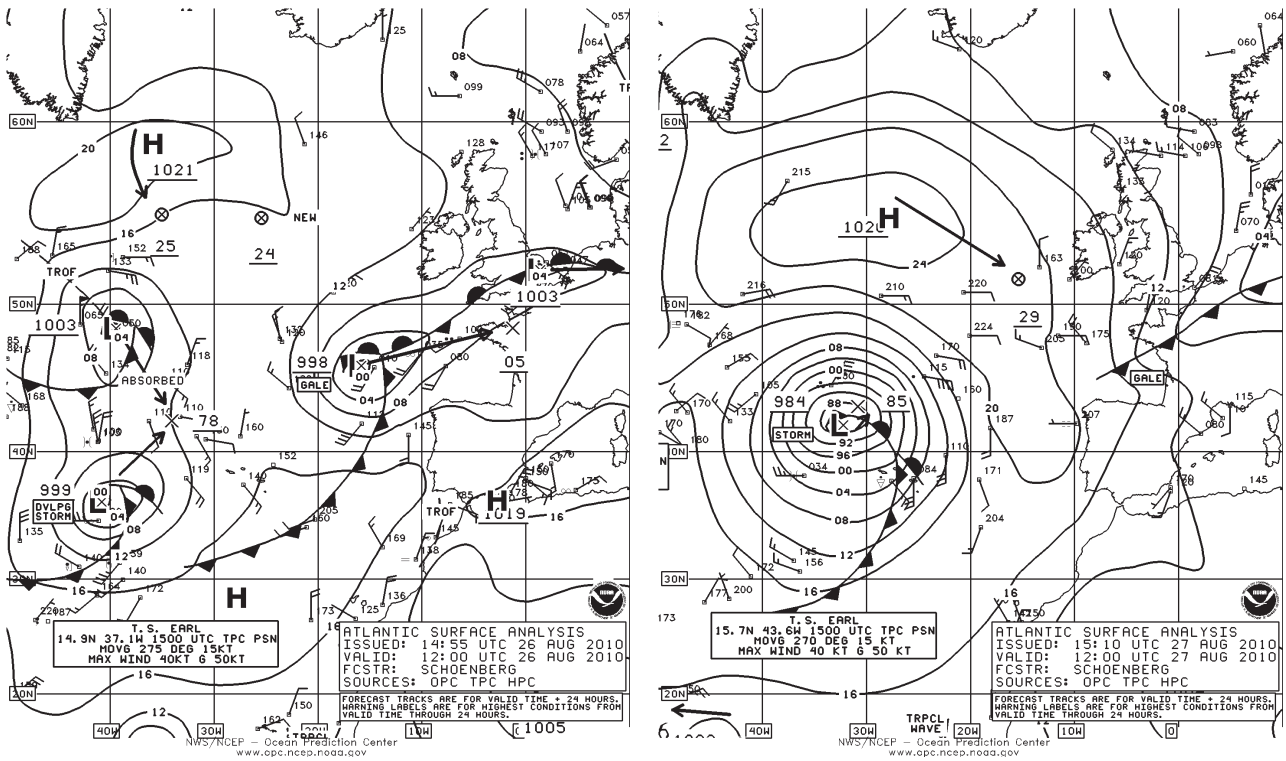


Figure 15. OPC North Atlantic Surface Analysis charts valid 1200 UTC August 26 and 27, 2010.

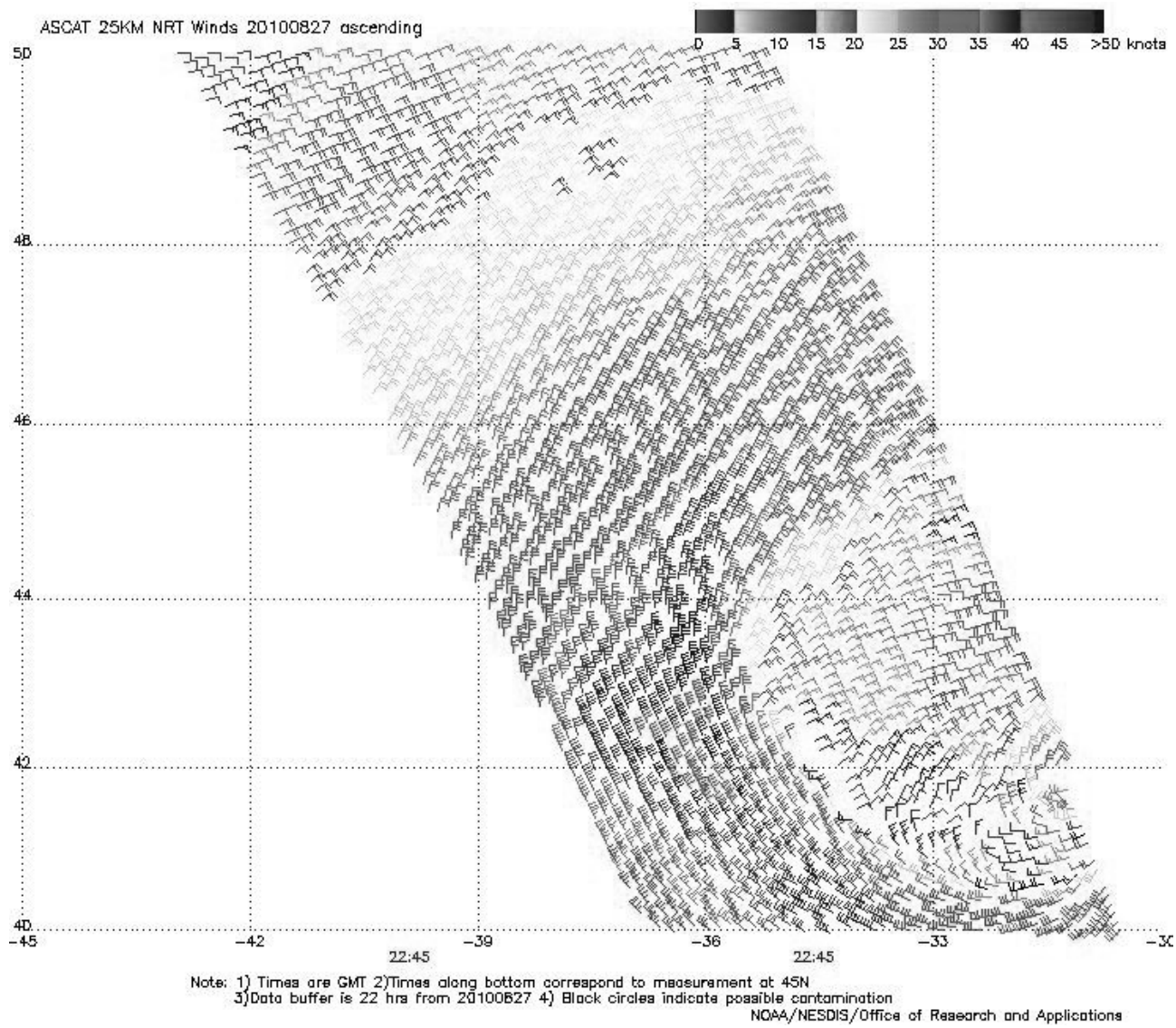


Figure 16.
ASCAT 25 km scatterometer image of satellite sensed winds around the west side of the storm shown in the second part of Figure 15. The valid time of the pass is 2245 UTC August 27, 2010, or ten and three-quarters hours later than the valid time of the second part of Figure 15. The center of the storm is near the lower-right edge of the image. Image is courtesy of NOAA/NESDIS/Center for Satellite Application and Research.

Marine Weather Review – North Pacific Area
May to August 2010

By George P. Bancroft
NOAA National Center for Environmental Prediction/ Ocean Prediction Center

Introduction

The period of May to August includes the late spring and summer months, a time of weaker cyclonic activity. For the North Pacific 2010 was no exception, with May being most active with five low pressure areas of non tropical origin producing winds of at least storm force, while June and July produced one each. August was overall the least active month with no low pressure systems of non tropical origin with winds exceeding gale force (higher than 47 kts).

Tropical activity normally picks up during this period as summer progresses but in 2010 only two western Pacific tropical cyclones affected OPC's ocean basin radiofacsimile chart area during the period. Both occurred in August, with Tropical Storms Dianmu in early August and Kompasu toward the end of the month. Dianmu later re intensified into a storm force post tropical (or extratropical) low as it approached the western Aleutian Islands. The tropical eastern North Pacific saw increased activity but unlike 2009, no tropical cyclones entered OPC's high seas area of responsibility north of 30N.

Tropical Activity

Tropical Storm Dianmu: Dianmu moved through the Sea of Japan as a weakening tropical storm and approached Japan as a tropical depression at 0000 UTC August 12 near 38N 136E with maximum sustained winds of 30 kts with gusts to 40 kts. Six hours later Dianmu became extratropical upon passing over northern Japan. *Figure 1* shows its subsequent re-intensification into an extratropical storm force low over a two day period as it moved toward the western Aleutian Islands. Table 1 lists selected ships reporting during this event. The cyclone briefly developed storm force winds on August 13 as it passed 250 nm east of the northern Kurile Islands. Post tropical Dianmu then passed about 300 nm south of the western Aleutian Islands as a gale late on the 14th, crossed the eastern Aleutians late on the 15th and then moved inland over mainland Alaska early on August 17.

Tropical Storm Kompasu: Tropical Storm 08W formed at 0000 UTC August 29 near the southwest edge of OPC oceanic radiofacsimile chart area near 21N 136E with maximum sustained winds of 40 kts with gusts to 50 kts. The cyclone was named Tropical Storm Kompasu twelve hours later as it passed near 22N 134E with maximum sustained winds of 45 kts with gusts to 55 kts. Kompasu then continued moving northwest away from the area to the end of the month.

Other Significant Events

North Pacific Storms, May 8-12: *Figure 2* shows this event as two storm systems, with the first shown in the first part of *Figure 2*, near maximum intensity, originating about 300 nm to the southeast 0000 UTC May 8. Its northward progress was blocked by high pressure over the Bering Sea and the cyclone was forced to turn southwest and then southeastward as shown in *Figure 2*. *Figure 3* is an ASCAT high-resolution image (25-km resolution) valid near the time of the first part of *Figure 2* showing a broad area of gales around the west and north sides of the cyclone with some higher wind retrievals of around 40 kts on the north side. The increasing low bias of ASCAT winds at higher wind speeds leads to analysis of this system as a storm force low. The conflicting wind directions at the eastern edge of the image are from an earlier pass and may be erroneous. The cyclone then weakened to a gale force low early on the 9th and redeveloped toward the northeast late on the 9th, resulting in a new gale force low near 49N 163W 0600 UTC May 10. This new low later became the storm shown in the second part of *Figure 2*. The storm force winds with this cyclone were mainly ahead of the occluded front approaching the Alaskan coast as indicated by gusts at buoys such as those listed in Table 2 below. The cyclone subsequently drifted west and then southwest in the Bering Sea with a weakening trend (*Figure 4*) and dissipated by the middle of the month.

Western North Pacific Storm of May 11-13: The development of this small but potent cyclone is depicted in *Figure 4*. It originated as a wave on a front southwest of Japan late on the 9th and rapidly developed east of Japan. The second part of *Figure 4* shows the cyclone at maximum intensity with its compact circulation developing a central pressure down to 983 hPa. *Figure 5* is a high-resolution ASCAT pass revealing wind retrievals as high as 50 kts on the south side of the system. The **Ryofu Maru** (JGQH) reported a west wind of 45 kts and 4.6 m seas (15 ft) near 36N 147E at 1800 UTC May 12 and highest seas 7.3 m (24 ft) six hours later near 37N 147E. A Jason-2 satellite altimeter pass at 0655 UTC May 13 (*Figure 6*) detected seas as high as 29 ft (30 m) near 38N 150E. The cyclone subsequently weakened to a gale on May 13 while moving northeast, and approached the eastern Aleutians as a gale on the 15th, stalled in

OBSERVATION	POSITION	DATE/TIME (UTC)	WIND	SEA(m/f)
VRBX7	34N 140E	12/0600	SW 40	5.0/16
Stuttgart Express (DGBE)	37N 143E	12/1200	SW 40	
A8BK6	51N 160E	13/09600	E 40	5.8/19
VQIC2	48N 158E	13/1200	W 45	6.0/20
Sea-Land Lightning (WDB9986)	51N 164E	14/0000	NE 50	5.2/17
SHJC	39N 158E	14/0600	SW 40	5.5/18
VRZL3	43N 171E	15/0000	W 35	7.3/24

Table 1. Selected ship observations taken during the passage of a northwestern Pacific cyclone (post-tropical Dianmu), August 12-14, 2010.

OBSERVATION	POSITION	DATE/TIME (UTC)	WIND	SEA(m/f)
V2MH	45N 176W 45N 171W	08/0900 09/0000	E 40 E35	5.0/16 7.0/23
3ENU7	50N 173E	09/0300	NE 35	9.0/30
Hong Kong Express (DHEB)	53N 157W	10/1200	E 40	
Ever Repute (3FRZ4)	52N 151W	10/2100	SE 45	7.0/23
Vienna Express (DGWF2)	53N 148W	11/0600	SE 40	8.5/28
Buoy 46061	60.2N 146.8W	12/0400	E 41 G51 Peak gust 54	5.0/16 Maximum 6.5/21
Buoy 46082	59.7N 143.4W	11/2100	SE 37 G47 Peak gust 49	5.5/18 Maximum 6.5/21
Buoy 46001	56.3N 148.0W	11/0600 11/0500 11/0800	SE 33 G41 Peak gust 43	5.0/16 Maximum 6.0/20
Augustine Island	59.4N 153.3W	11/1700 11/1800	NE 41 G47 Peak gust 49	

Table 2. Ship, buoy and coastal C/MAN automated station observations taken during the passage of the North Pacific storms of May 8-12, 2010.

the southwest Gulf of Alaska from late on the 16th through the 18th. The cyclone then resumed eastward motion on the 19th with dissipation occurring later that day (*Figure 7*).

Northeast Pacific Storm, May 19-20: The development of this small but compact and potent storm is shown in *Figure 7* over a twenty-four hour period in which its central pressure fell 18 hPa. It originated as a weak frontal wave of low pressure over the southwestern waters of the North Pacific on May 15. The cyclone was actually more impressive in its satellite presentation (*Figure 8)* with its intense and well defined cloud circulation in visible imagery) and winds reported by satellite and ships, than indicated from its central pressure in *Figure 7.* The 55 kts wind retrievals shown in the ASCAT imagery in *Figure 9* are the highest that the author can recall seeing with any cyclone in the North Pacific during the four month period. Given the low biases of ASCAT winds

OBSERVATION	POSITION	DATE/TIME (UTC)	WIND	SEA(m/f)
Celebrity Infinity (9HJD9)	49.5N 127.3W	20/0600	SE 70	
Global Sentinel (V7KR4)	48N 126W	20/0600	SW 47	10.7/35
Buoy 46132	49.7N 127.9W	20/0400 20/0700	E 35 G47	5.0/16 Maximum 6.0/20
Buoy 46041	47.4N 124.7W	20/0100 20/0400	39 G49	5.5/18 Maximum 8.5/28
Buoy 46211	46.9N 124.2W	20/0400	SW 45	8.5/28
Buoy 46029	46.1N 124.5W	20/0000 20/0300	SW 37 G47	6.0/20 Maximum 8.5/28
Buoy 46089	45.9N 125.8W	19/2200 20/0000	S 43 G56	6.5/21 Maximum 9.5/31
Buoy 46050	44.6N 124.5W	19/1900 20/0300	S 35 G49	3.5/11 Maximum 7.5/25
Buoy 46206	48.8N 126.0W	20/0100 20/0500	SE 39 G51	4.0/12 Maximum 7.0/23
Destructive Island (DESW1)	47.7N 124.4W	20/0200	SE 53 G61 Peak gust 73	

Table 3. Selected ship, buoy and coastal C/MAN automated station observations taken during the passage of the northeastern Pacific storm of May 19-20, 2010.

especially at the higher wind speeds, this cyclone may have briefly developed hurricane force winds in a small area south of the center shortly after the map time in the second part of *Figure 7.* The central pressure was 988 hPa six hours later at 0000 UTC on the 20th. Some ship, buoy and coastal observations taken in this storm are listed in Table 3. The report of 70 kts from the **Celebrity Infinity** had a high bias of 7 kts. The cyclone was short lived, however, as it subsequently weakened to a gale near the Queen Charlotte Islands the next day, stalled and dissipated late on the 21st.

North Pacific Storm, May 23-25: The development of this central North Pacific system is shown in *Figure 1*0. This development was similar to that of the first storm in the May 8-12 period, and this cyclone was again blocked by a ridge to the north and forced to turn west on the 24th. The central pressure fell 19 hPa in the twenty-four hour period ending at 1200 UTC May 24. The **MOL Velocity** (9VVK) near 43N 172E reported west winds of 55 kts and 4.0 m seas (13 ft) at 0900 UTC on the 24th. By comparison, the ASCAT imagery in *Figure 11* shows southwest winds around 40 kts just east of the vessel and similar winds, from the north and northeast, north and west of the cyclone center (near middle of image). A vessel using the SHIP identifier near 47N 179E reported southeast winds of 45 kts and 3.7 m seas (12 ft) at 1800 UTC on the 24th. The **Hoechst Express** (51N 171E) encountered east winds of 40 kts and 6.5 m seas (21 ft) at 0000 UTC on the 25th. The cyclone subsequently turned toward the southeast early on May 25 and dissipated later that day or became absorbed by a new gale force cyclone forming to the northeast near the central Aleutian Islands.

Northeastern Pacific Storm, June 10-12: Originating as a frontal wave of low pressure in the western North Pacific near 37N 171E early on June 8, the main development of this cyclone is shown in *Figure 1*2. The central pressure fell 20 mb in the twenty four hour period ending at 0600 UTC on the 11th. The lowest central pressure was 976 mb reached eighteen hours later when the center was near 53N 149W. A high-resolution ASCAT image in *Figure 1*3 reveals the stronger winds of 33 to 42 kts concentrated on the south side of

the storm center and the occluded front, well defined in the image as a boundary between the stronger winds to the west and north and the much lighter winds on the other side. There is a small area of 42 to 48 kts winds southeast of Kodiak Island. The **APL Korea** (WCX8883) near 49N 154W reported east winds of 40 kts and 6.0 m seas (20 ft) at 1500 UTC on the 10th, followed twelve hours later by a report of southwest winds of 40 kts and 5.0 m seas (16 ft) near 50N 148W. The **Beaumagic** (PHKH) near 53N 130W reported south winds of 50 kts at 0700 UTC on the 12th. The buoy 46084 (56.6N 136.1W) reported southeast winds of 37 kts with gusts to 45 kts (peak 49 kts) and 3.5 m seas (11 ft) at 2000 UTC June 11, followed by a maximum significant wave height of 6.5 m (21 ft) twenty four hours later. The cyclone subsequently weakened while moving northeast and weakened to a gale early on the 12th, and then turned southeast and dissipated near Southeast Alaska on the 14th.

North Pacific Storm of July 8-9: The only low pressure area to produce storm force winds in July also became the most intense of the period in the North Pacific in terms of central pressure, developing a central pressure of 969 mb. *Figure 14* shows the development over a forty-eight hour period from a secondary low forming on the junction of an occluded front, cold and warm fronts known as a "triple point". This slow moving system is shown at maximum intensity approaching the central Aleutian Islands, impeded by high pressure over the northern Bering Sea. Storm force winds lasted from the afternoon of the 8th until early on July 9. The slowly weakening cyclone then folowed a track just south of the eastern Aleutians and Alaska Peninsula on the 9th and 10th before dissipating near the southern coast of mainland Alaska on July 11. Some ship and buoy observations taken during passage of this cyclone are listed in Table 4. ⚓

OBSERVATION	POSITION	DATE/TIME (UTC)	WIND	SEA(m/f)
SHIP	47N 174E	07/1800	SW 40	5.0/16
Ocean Harvester (WBO5471)	53.4N 167.5W	09/0200	SE 50	
APL China (WDB3161)	54N 176W 53N 176E	09/0600 09/1800	NE 40 N 45	5.5/18 4.0/13
Hong Kong Express (DHEB)	56N 178W	09/0600	NE 35	7.0/23
Dominator (WBZ4106)	54N 178W	09/0600	NE 35	7.0/23
SHIP	46N 165W	10/0600	SW 35	7.9/26
Buoy 46073	54.9N 172.0W	09/0400 09/0900	NE 35	3.7/12 Maximum 4.5/15

Table 4. Selected ship and buoy observations taken during the passage of the North Pacific storm of July 8-9, 2010.

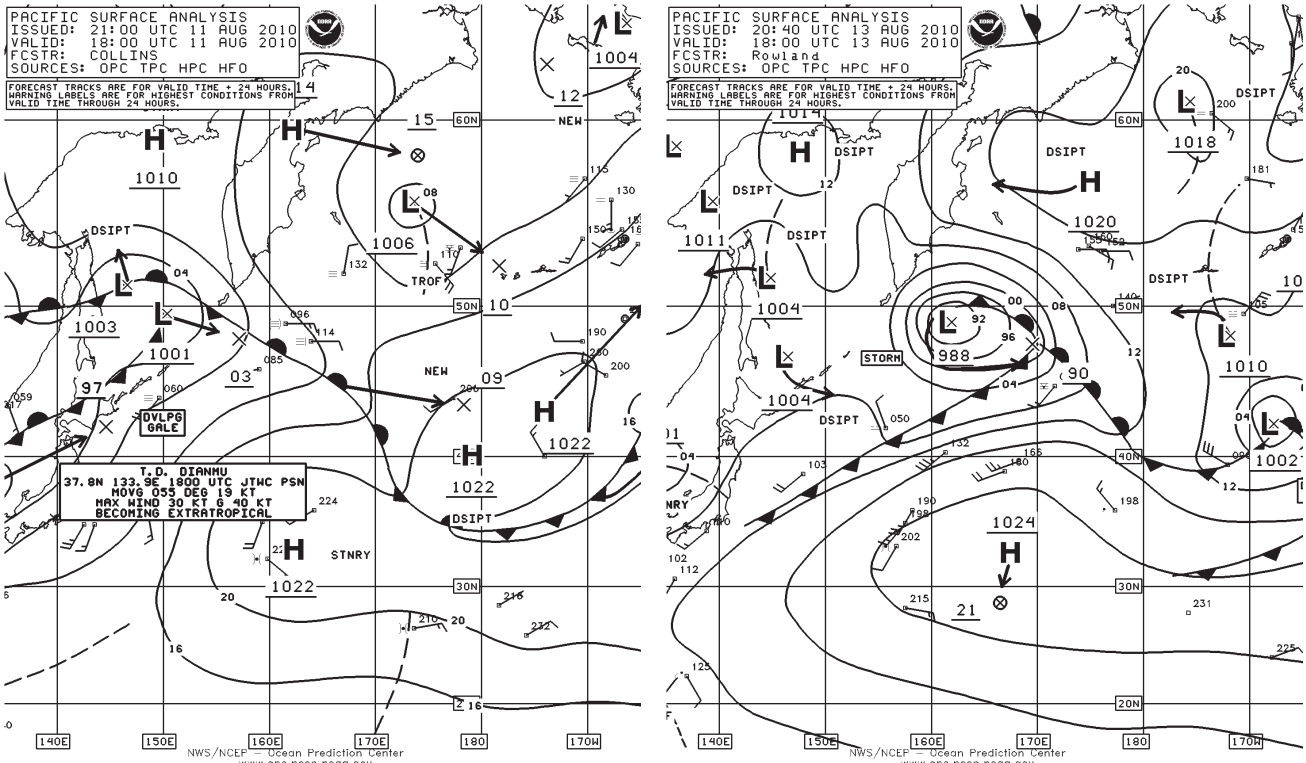


Figure 1. OPC North Pacific Surface Analysis charts valid 1800 UTC August 11 and 13, 2010.

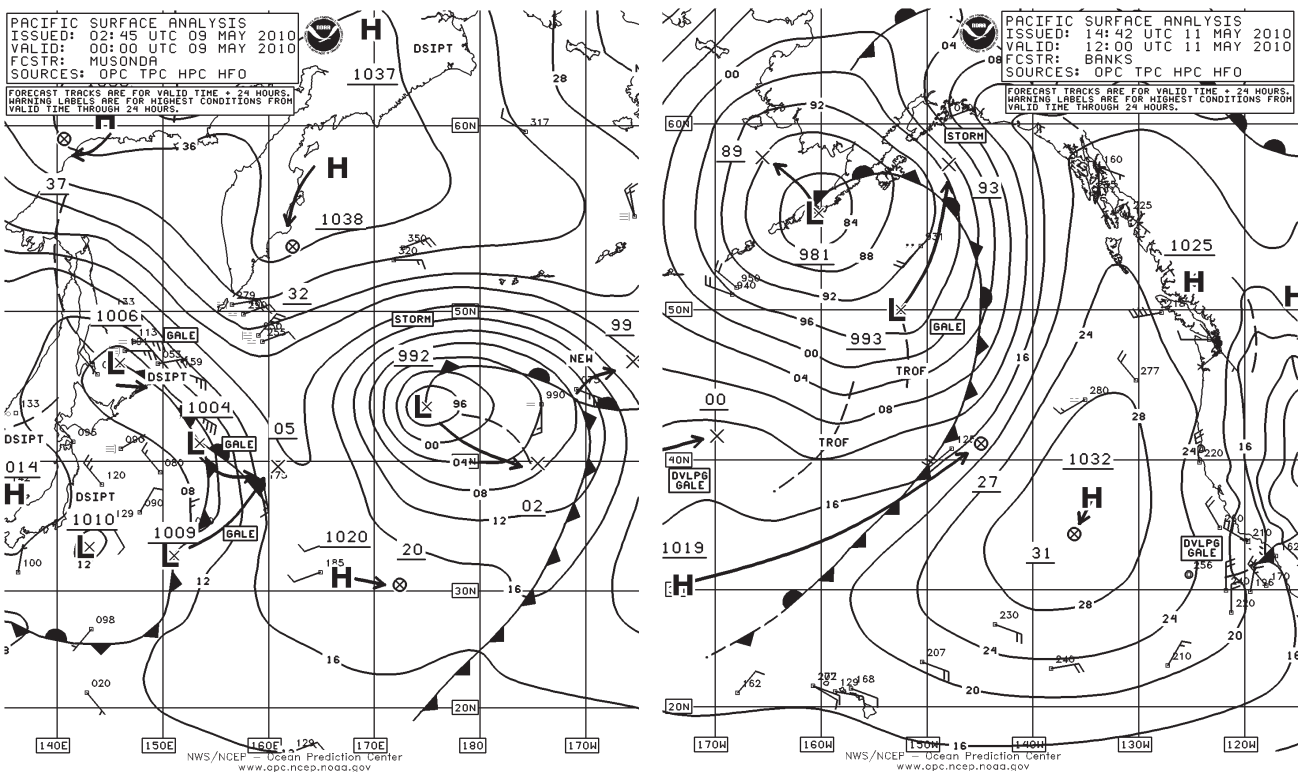


Figure 2. OPC North Pacific Surface Analysis charts valid 0000 UTC May 9 and 1200 UTC May 11, 2010 .

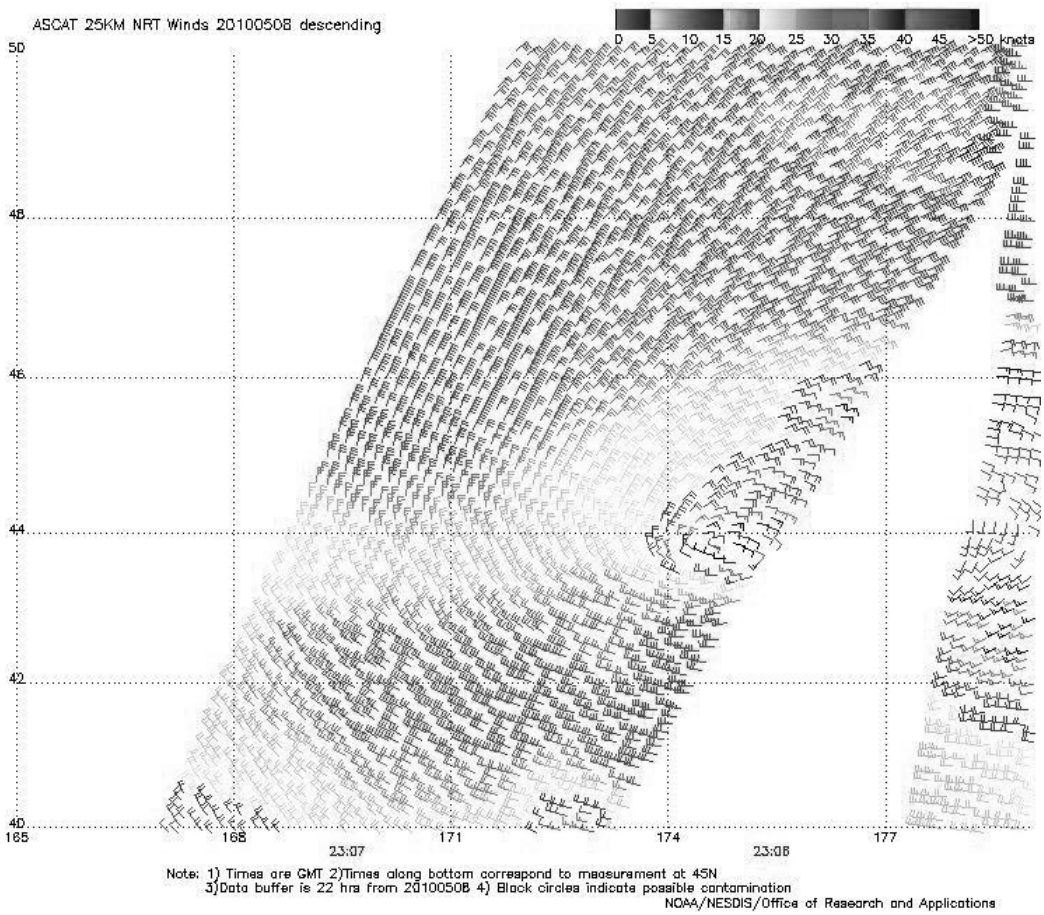


Figure 3. ASCAT scatterometer image of satellite-sensed winds around the storm shown in the first part of Figure 2. The resolution is 25 km, versus 50 km in the coarser resolution version of the imagery. The valid time of the pass is 2306 UTC May 8, 2010, or about one hour prior to the valid time of the first part of Figure 2. Image is courtesy of NOAA/ NESDIS Center for Satellite Application and Research.

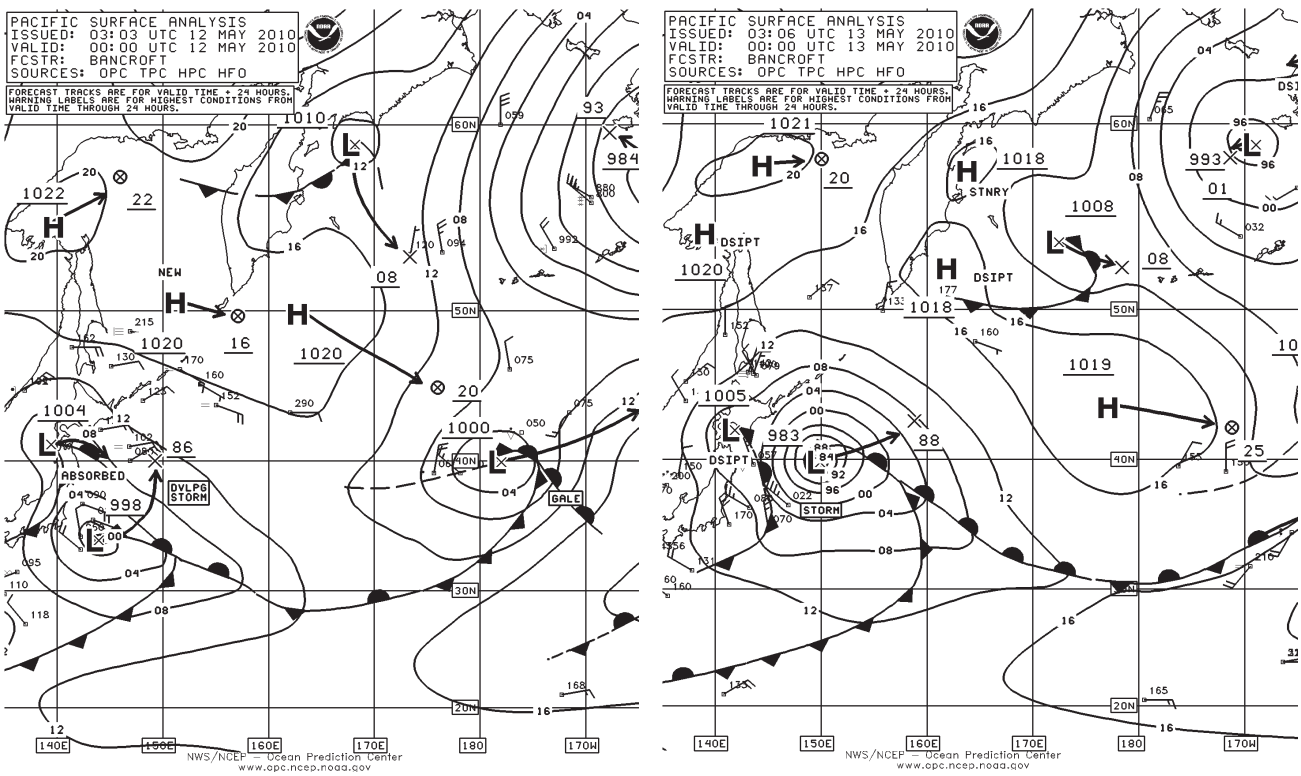


Figure 4. OPC North Pacific Surface Analysis charts valid 0000 UTC May 12 and 13, 2010.

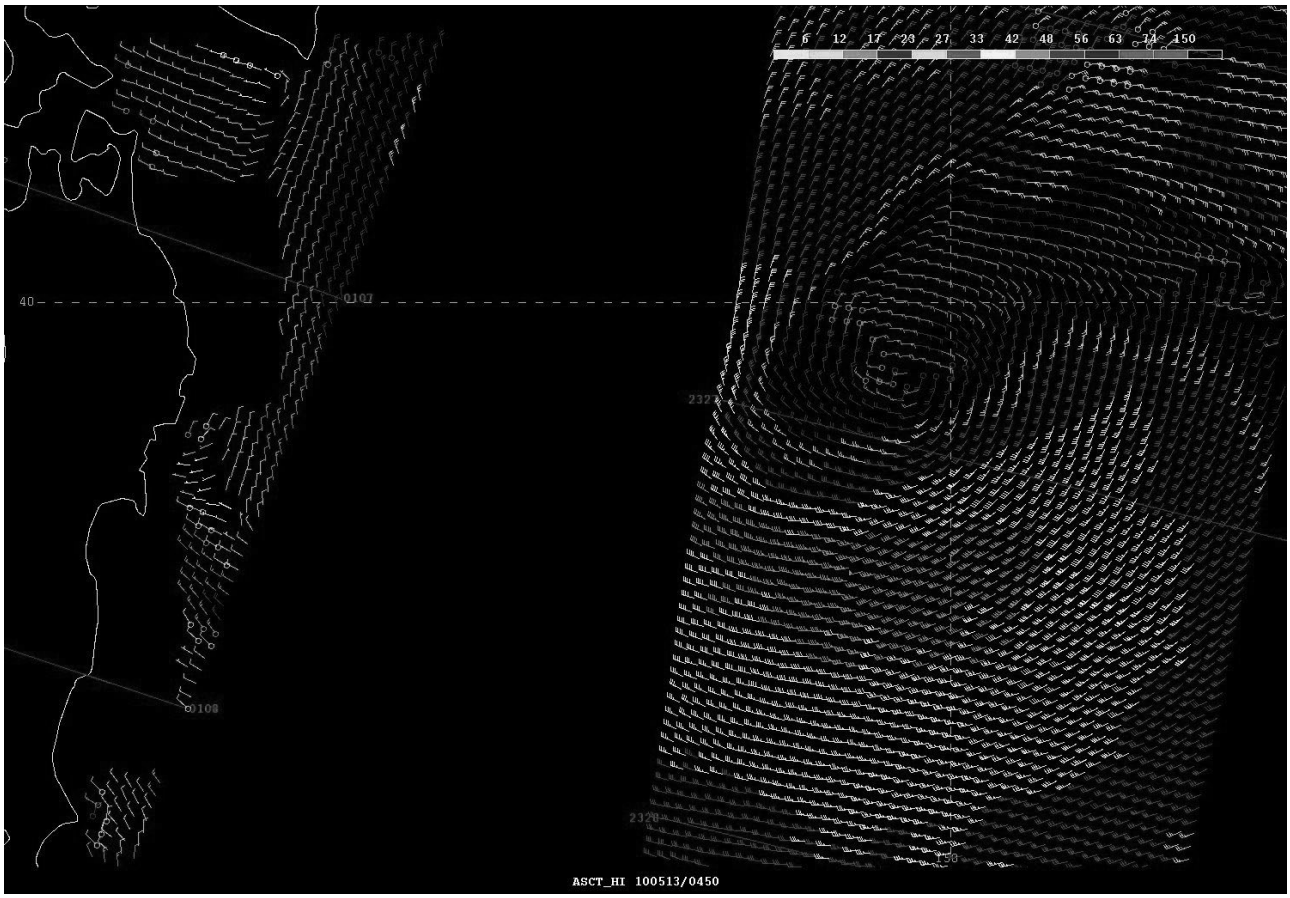


Figure 5.
ASCAT 25 km scatterometer image of satellite sensed winds around the storm shown in the second part of Figure 4. The image contains portions of two passes with the eastern pass (valid about 2327 UTC May 12, 2010) containing the strongest winds and the center of the cyclone, near 40N 150E. A portion of northern Japan appears on the left side of the image. The valid time of the eastern pass is about one-half hour prior to the valid time of the second part of Figure 4. This form of the imagery adapted for OPC operational use contains numbered cross-track time lines (UTC) of the satellite.

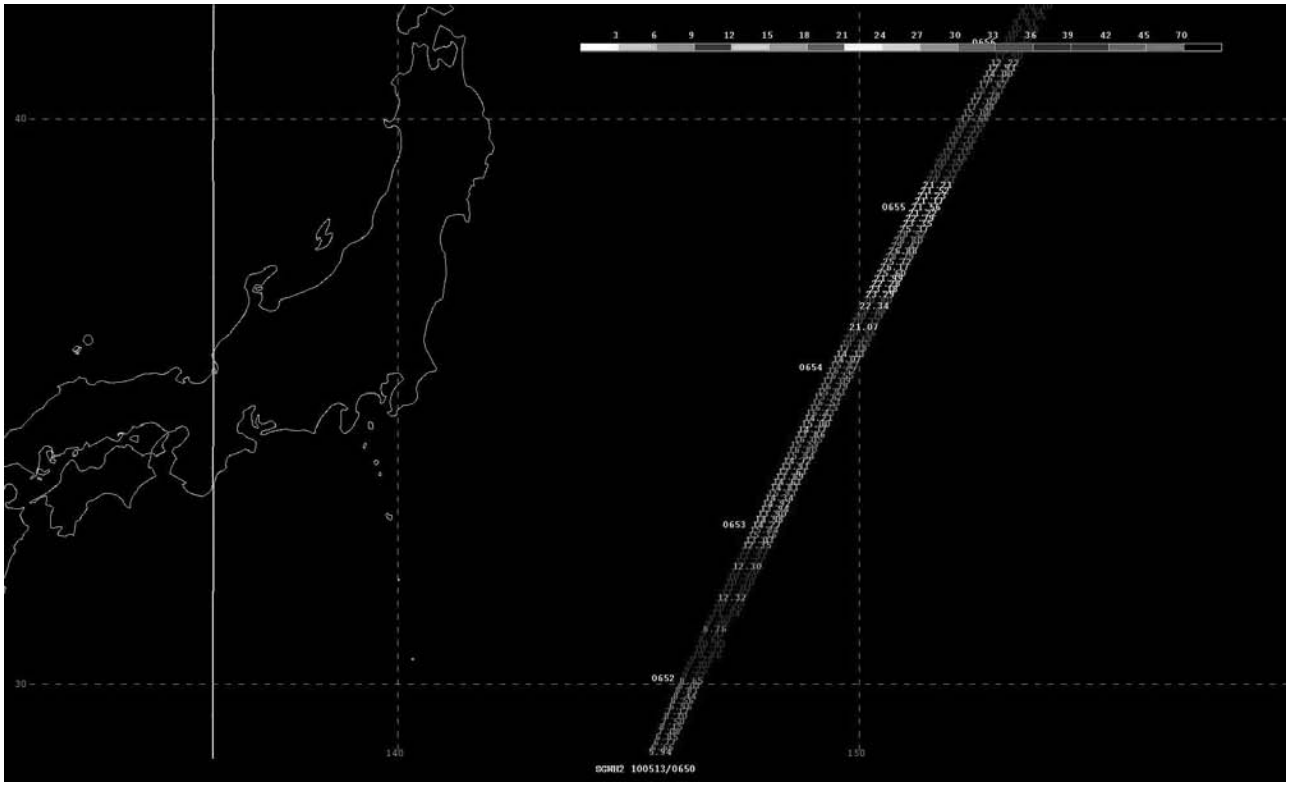


Figure 6.
Jason-2 altimeter pass of satellite-sensed significant wave heights on the southwest side of the storm shown in the second part of Figure 4. The image contains a swath of numbers in ft with two decimal places and four digit satellite times (UTC) given to the left of the track. The highest seas, about 28 ft (8.5 m) appear near the center of the image. The valid time of the pass is approximately seven hours later than the valid time of the second part of Figure 4.

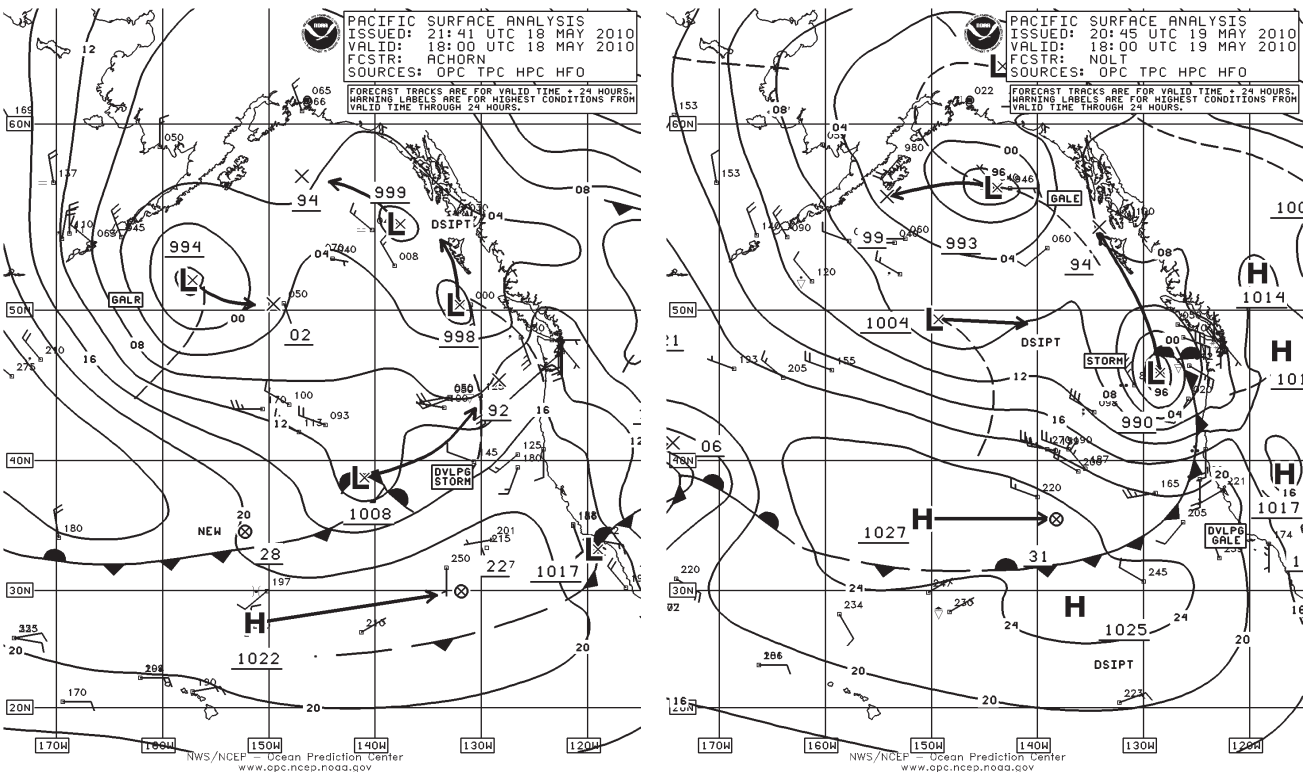


Figure 7. OPC North Pacific Surface Analysis charts valid 1800 UTC May 18 and 19, 2010.

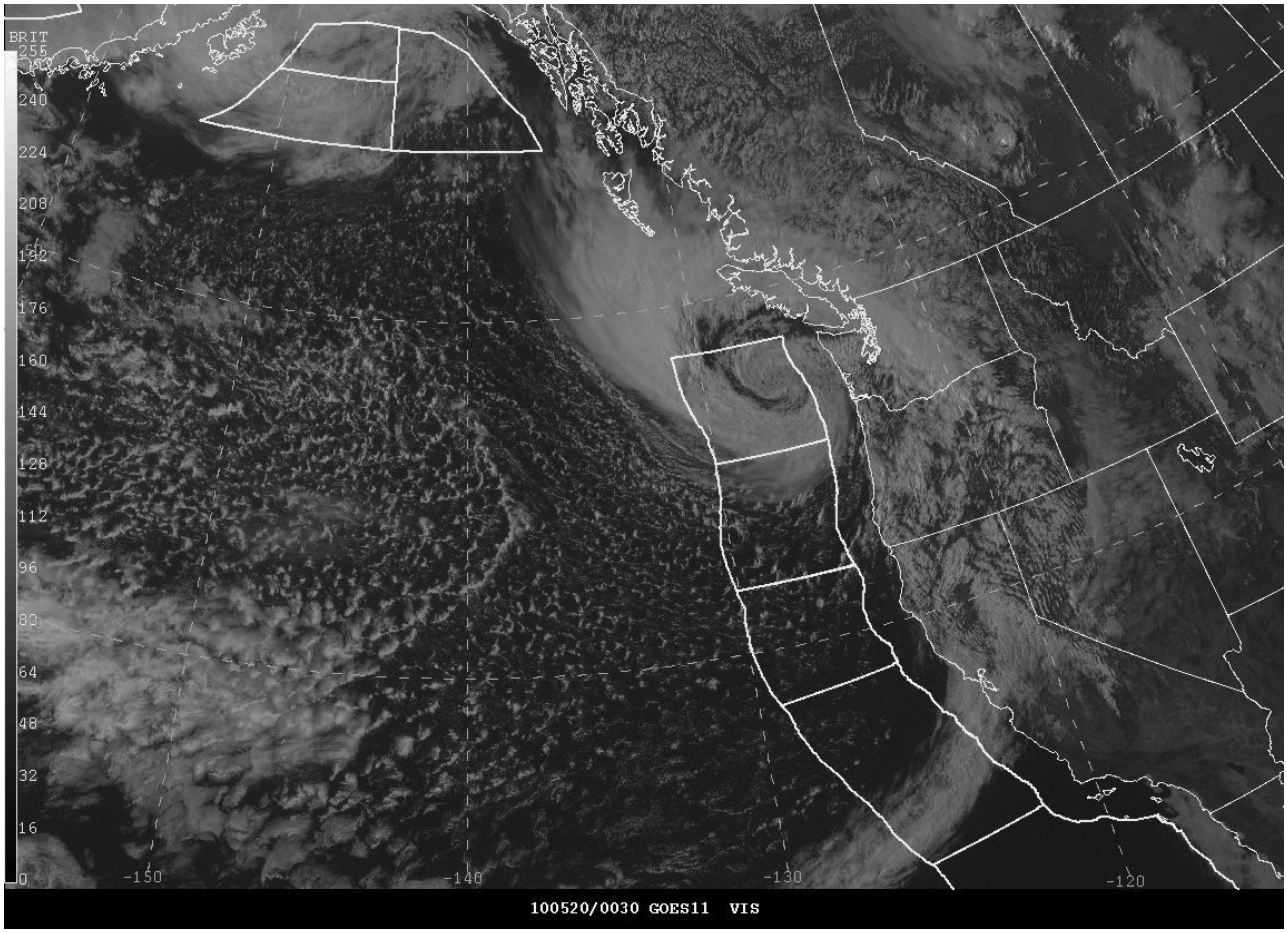


Figure 8.
GOES11 visible satellite image of portions of western North America and the northeastern Pacific valid 0030 UTC May 20, 2010, or six and one-half hours later than the valid time of the second part of Figure 7.

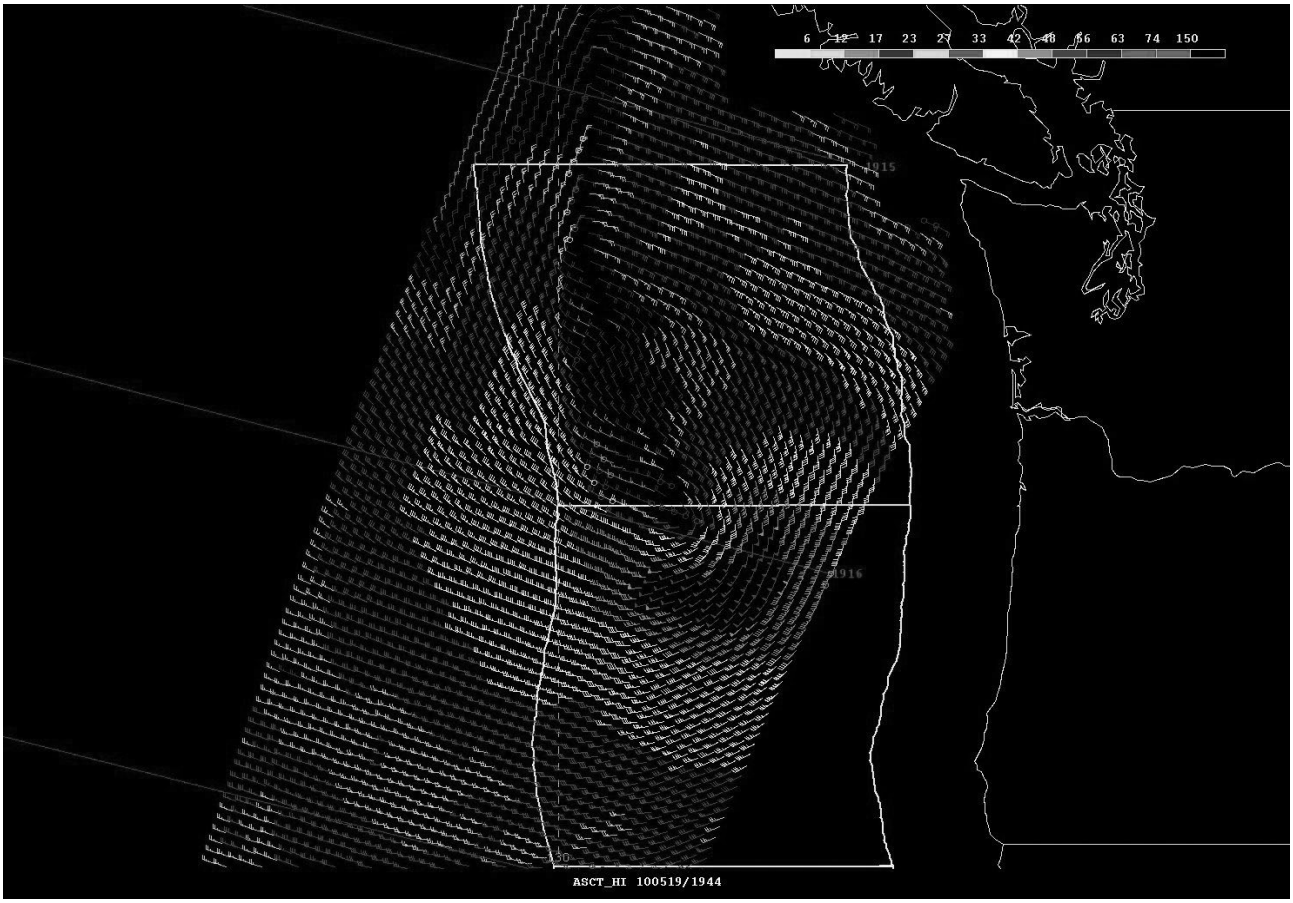


Figure 9.
ASCAT 25 km scatterometer image of satellite-sensed winds around the storm shown in the second part of Figure 7. The valid time of the pass is about 1916 UTC May 19, 2010 or one and one-quarter hours later than the valid time of the second part of Figure 7. The center of the cyclone is near the center of the image, west of the northern Oregon coast. This form of the imagery adapted for OPC operational use contains numbered cross-track time lines (UTC) of the satellite and a color scale for the wind barbs on the upper-right side.

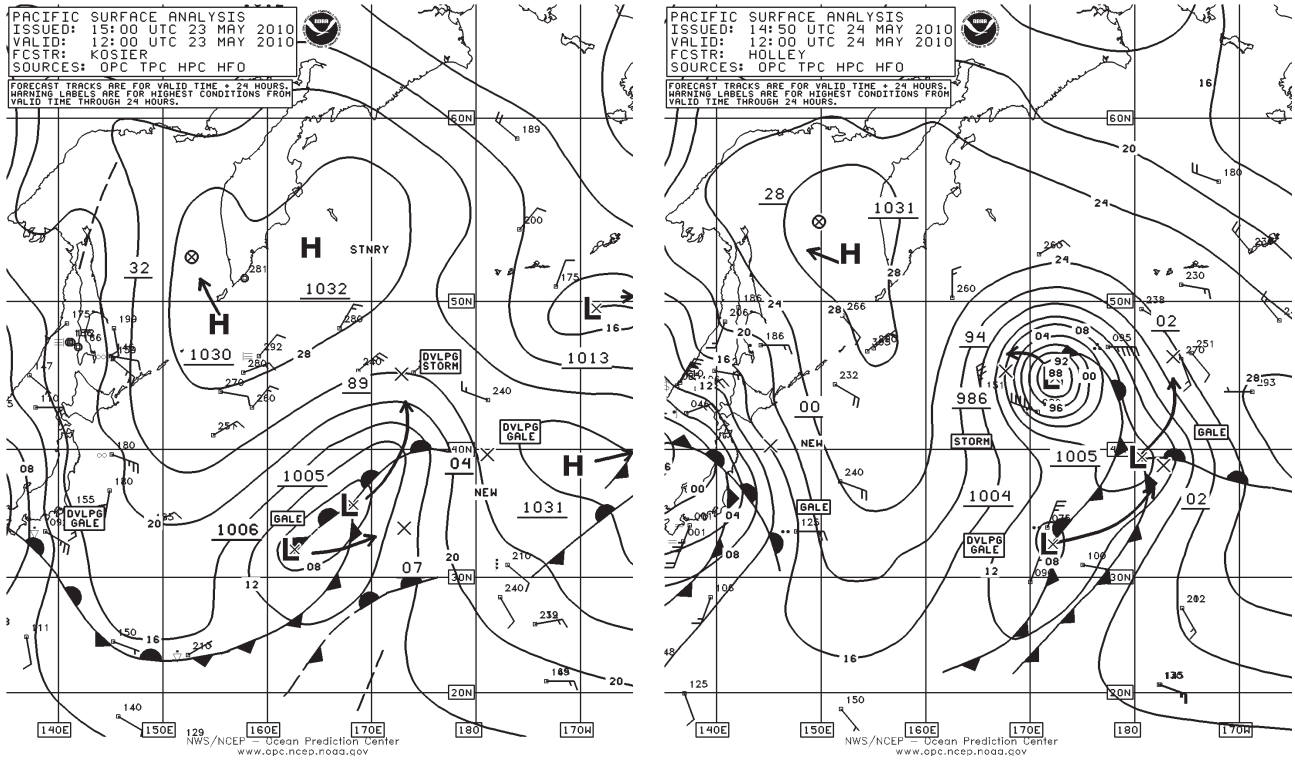


Figure 10. OPC North Pacific Surface Analysis charts valid 1200 UTC May 23 and 24, 2010.

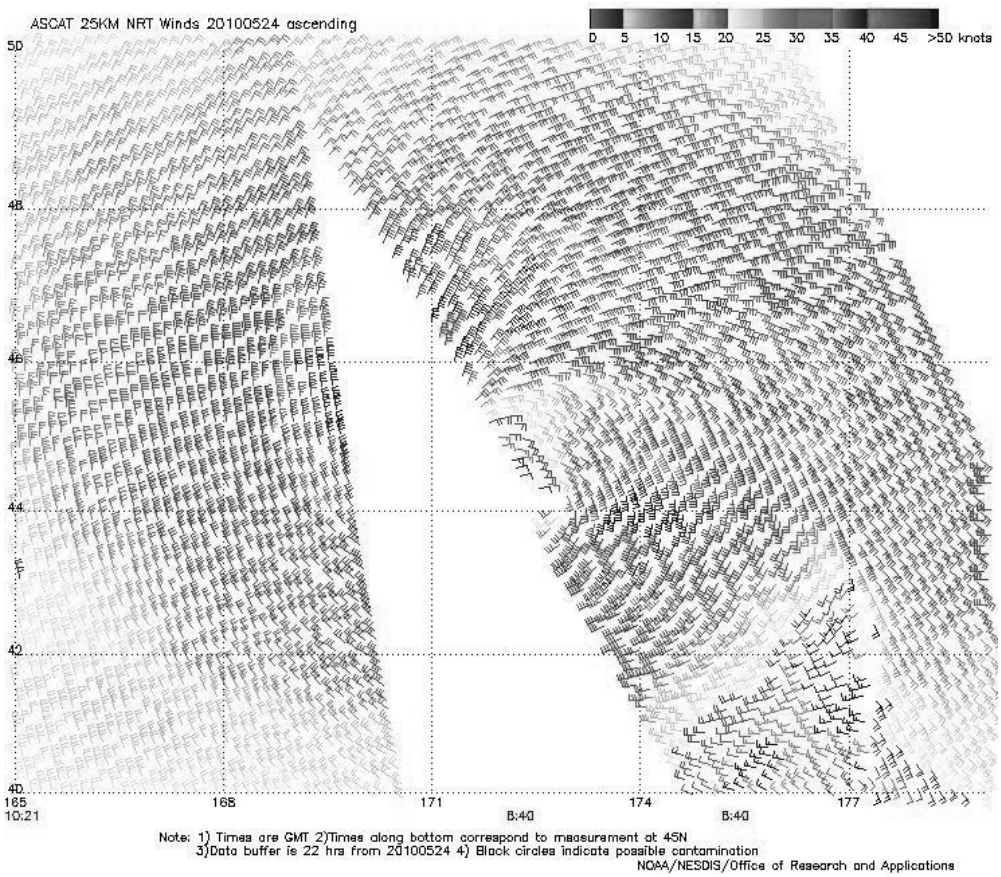


Figure 11. ASCAT 25 km scatterometer image of satellite sensed winds around the storm shown in the second part of Figure 10. The image contains portions of two passes valid 0840 UTC and 1021 UTC May 24, 2010, or less than three and one-half hours prior to the valid time of the second part of Figure 10. The center of the storm is near the center of the image. Image is courtesy of NOAA/ NESDIS Center for Satellite Application and Research.

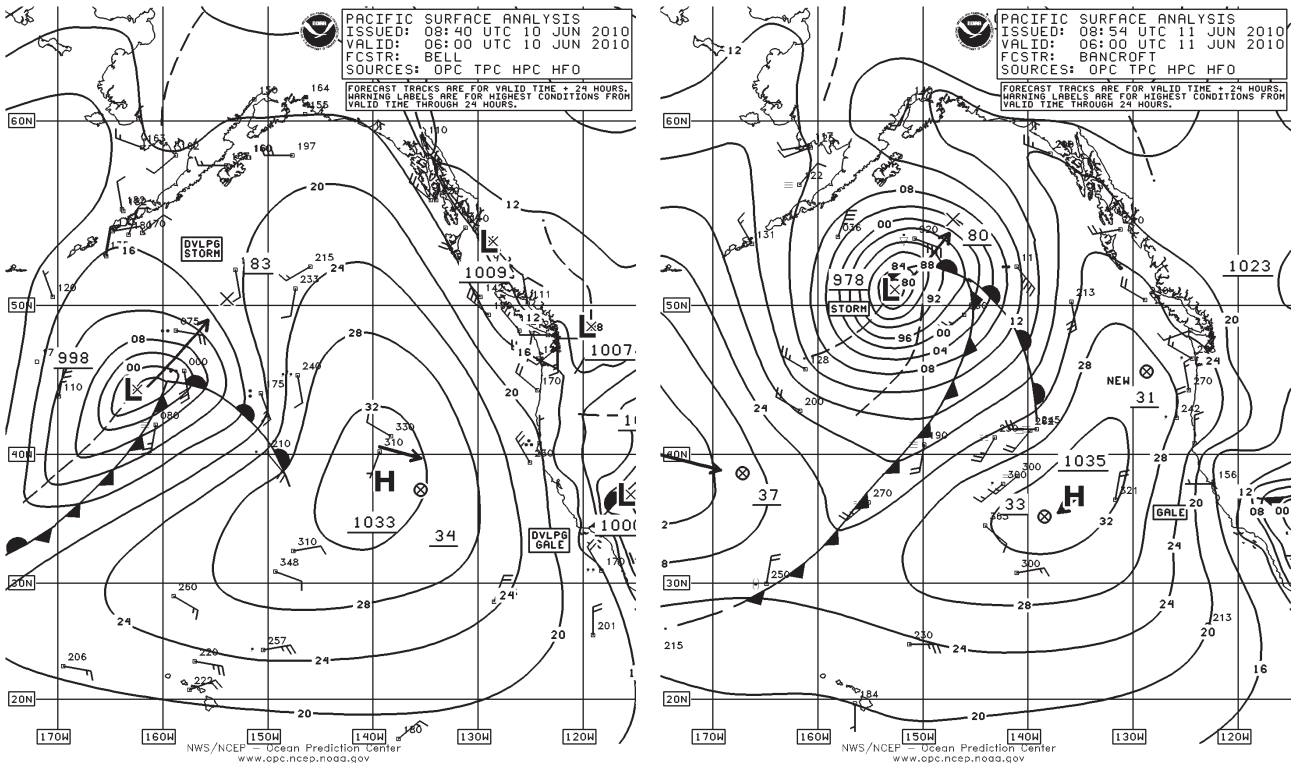


Figure 12. OPC North Pacific Surface Analysis charts valid 0600 UTC June 10 and 11, 2010.

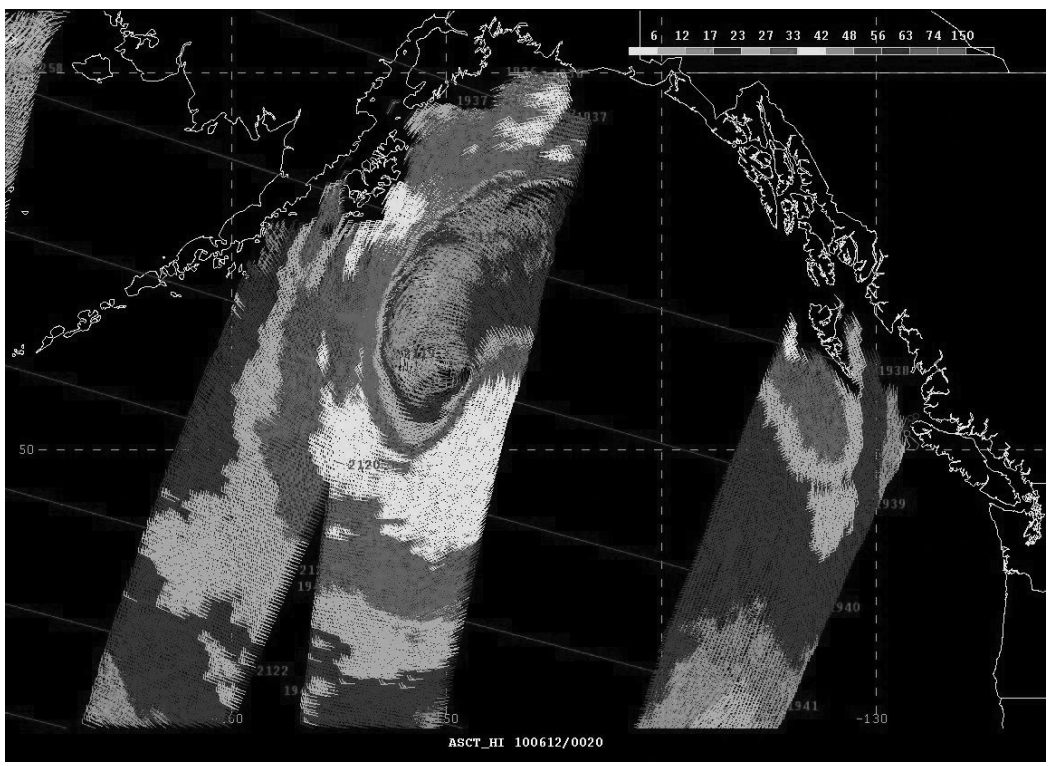


Figure 13. ASCAT 25 km scatterometer image of satellite-sensed winds around the storm shown in the second part of Figure 12. The image contains portions of two passes valid about 1939 UTC and 2120 UTC June 11, 2010, or less than fifteen and one-half hours later than the valid time of the second part of Figure 12. The center of the cyclone is near the center of the image, near 52N 150W. This form of the imagery adapted for OPC operational use contains numbered cross-track time lines (UTC) of the satellite and a color scale for the wind barbs on the upper-right side.

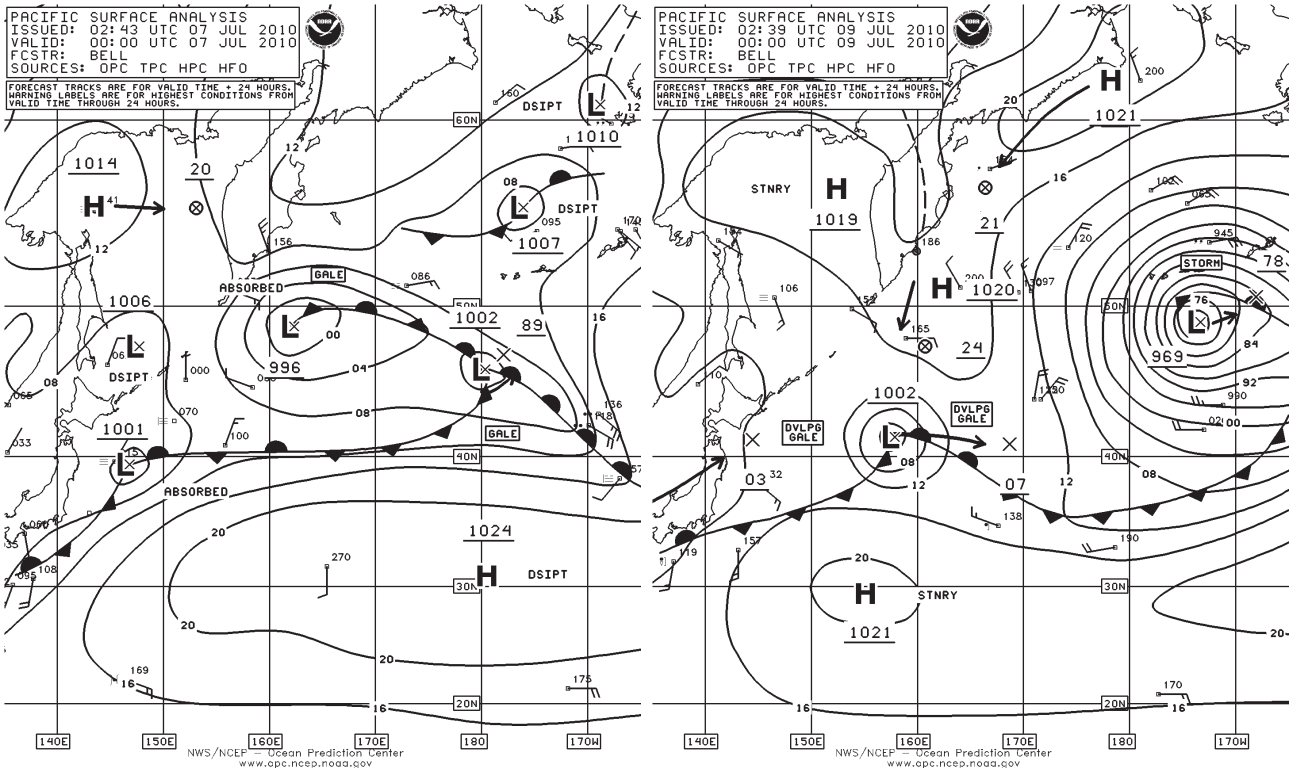


Figure 14. OPC North Pacific Surface Analysis charts valid 0000 UTC July 7 and 9, 2010.

Tropical Atlantic and Tropical East Pacific Areas
May through August 2010

Jessica Schauer, Marshall Huffman and Scott Stripling
Tropical Analysis and Forecast Branch,
National Hurricane Center, Miami, Florida
NOAA National Center for Environmental Prediction

Deepwater Horizon Support

On 20 April 2010, an explosion on the Deepwater Horizon oil platform in the Gulf of Mexico off the southeast Louisiana coast near 28.7°N 88.4°W resulted in the loss of eleven lives and the expulsion of oil into the Gulf of Mexico through 15 July 2010 (Spruill 2010). The National Oceanic and Atmospheric Administration (NOAA) was tasked to provide operational support to the first responders involved in the containment and clean up of the oil. The National Hurricane Center's (NHC) Tropical Analysis and Forecast Branch (TAFB) supplied their operational graphical and text forecasts to the Deepwater Horizon briefing website hosted by the National Weather Service (NWS) Weather Forecast Office (WFO) in New Orleans/ Baton Rouge, Louisiana.

http://www.srh.noaa.gov/lix/?n=embriefing

Prior to this event, TAFB had been experimenting with the generation of gridded marine forecast products for their Area of Responsibility (AOR). TAFB was asked to provide these experimental gridded forecasts for the region impacted by the spill to NOAA in support of the relief efforts. These experimental products provide 12.5 km resolution gridded mean sea level pressure, 10 meter wind speed and direction, dominant wave period, significant wave height, and primary

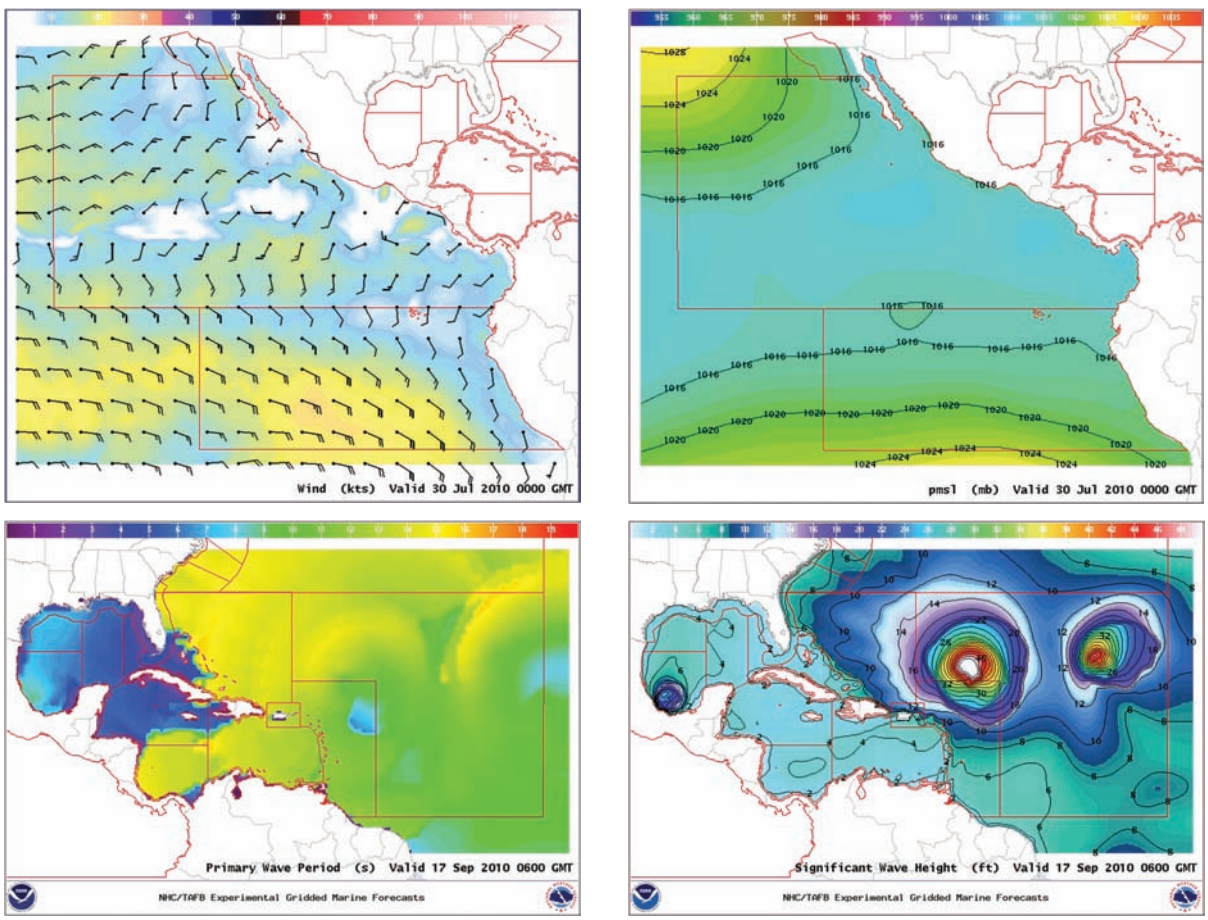


Figure 15. Examples of the experimental graphical forecast products from TAFB available on the NHC website. Beginning on the top right and moving clockwise are mean sea level pressure (in hecta-Pascals), significant wave height (in feet), wave period (in seconds), and wind direction and speed (in knots).

Table 1. Non-tropical warnings issued for the Atlantic between 01 May 2010 and 31 August 2010.

Onset	Region	Peak Wind Speed	Duration	Forcing
1200 UTC 23 May	SW N Atlc	40 kts	42 hours	Low pressure system
1800 UTC 03 Aug	Tropical N Atlc	45 kts	42 hours	TS Colin Remnant Low

swell forecasts through five days. These forecasts are currently available to view and download in netCDF format on the National Hurricane Center website:

http://www.nhc.noaa.gov/tafb/gridded_marine/index.php

When these gridded products become operational, they will provide value added marine forecasts updated every twelve hours that have been coordinated with the Ocean Prediction Center (OPC) in Camp Springs, Maryland, and the NWS coastal WFOs bordering the TAFB AOR. *Figure 1* shows examples of the graphical products that are available on the NHC website. These new products expand the available forecast information from TAFB in their tropical Atlantic High Seas Forecast AOR and eastern Pacific High Seas Forecast AOR from two days to five days. While these graphics will not replace the text products and black and white graphics designed to be easily accessible to mariners at sea, they will supplement those routine products by giving forecast information at intermediate and extended time periods at high resolution. Once operational, the current suite of text and graphical products will be generated directly from these gridded forecasts. This will ensure continuity in the TAFB product suite.

North Atlantic Ocean to 31N and Eastward to 35W, including the Caribbean Sea and the Gulf of Mexico

Table 1 describes the two non-tropical warning events that occurred within the TAFB AOR during the period from May through August 2010. The first event was driven by a complex area of low pressure over the southwest North Atlantic. *Figure 2* shows the NWS Unified Surface Analysis from 0000 UTC on 23 May when the system was at its most intense. The pressure gradient between this system and high pressure behind a cold front over the Central Atlantic was strong enough to produce gale force winds primarily in the northeast semicircle of the low pressure system. Winds just below gale force were observed by the European Space Agency's Advanced SCATerometer (ASCAT) around 0200 UTC on 23 May and gale force winds of 38 kts were reported by the **Horizon Navigator** (WPGK) near 28.7ºN 69.4ºW at 1800 UTC that day. There were few ships reporting in the gale area during the event, but National Data Buoy Center (NDBC) Buoy 41048 just north of the forecast area near 32.0ºN 69.6ºW reported winds of 35-37 kts from 1450-2350 UTC on 24 May. Gale warnings were lowered over the TAFB AOR at 0600 UTC on 25 May.

The second event occurred after Tropical Storm Colin degenerated into a remnant surface low within the TAFB AOR on 03 August. The convection associated with Colin became disorganized as it passed through a region of strong westerly wind shear induced by a complex upper-level trough over the western North Atlantic. Colin was also moving northwest at a forward speed of 25-30 kts at the time it was downgraded. The remnants of Colin further diminished to an open trough of low pressure on 04 August. During the time that TAFB issued non-tropical gale warnings on the remnants of Colin, an area of gale force winds of up to 40 kts remained in close proximity to the east side of the remnant surface trough axis while the area of winds between 20 kts and gale force spanned an area as large as 400 nmi west of the system and 500 nmi east of the system. Examples of the expansive wind field with the system are seen in the ASCAT passes from around 1500 UTC 04 August and 0000 UTC 05 August shown in *Figure 3*. At 1500 UTC, NDBC Buoy 41044 reported sustained south-southeast winds of 31 kts and 10 ft seas just east of the system center while ship **Agulhas Stream** (PJKV) reported south-southeast winds of 23 kts and 9 ft seas approximately 300 nmi southeast of the system center.

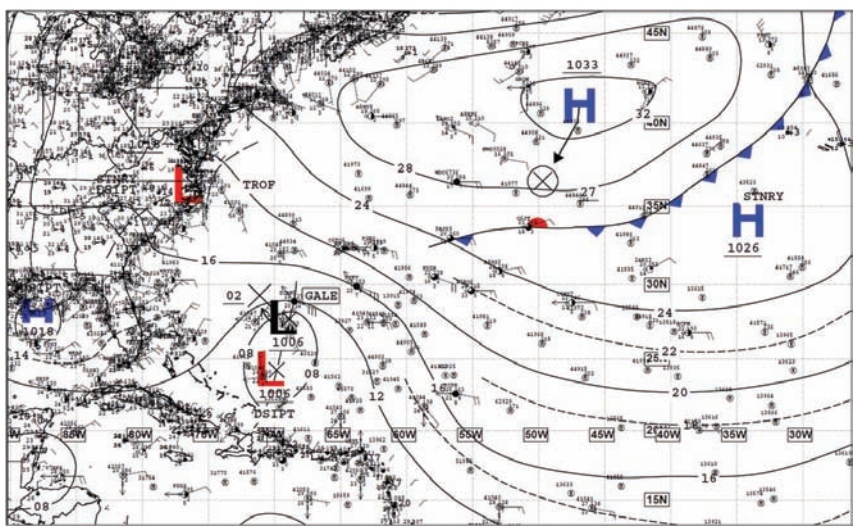


Figure 2. NWS Unified Surface Analysis from 23 May 2010 at 0000 UTC. Note the 1006 hPa complex low pressure system east of the Bahamas.

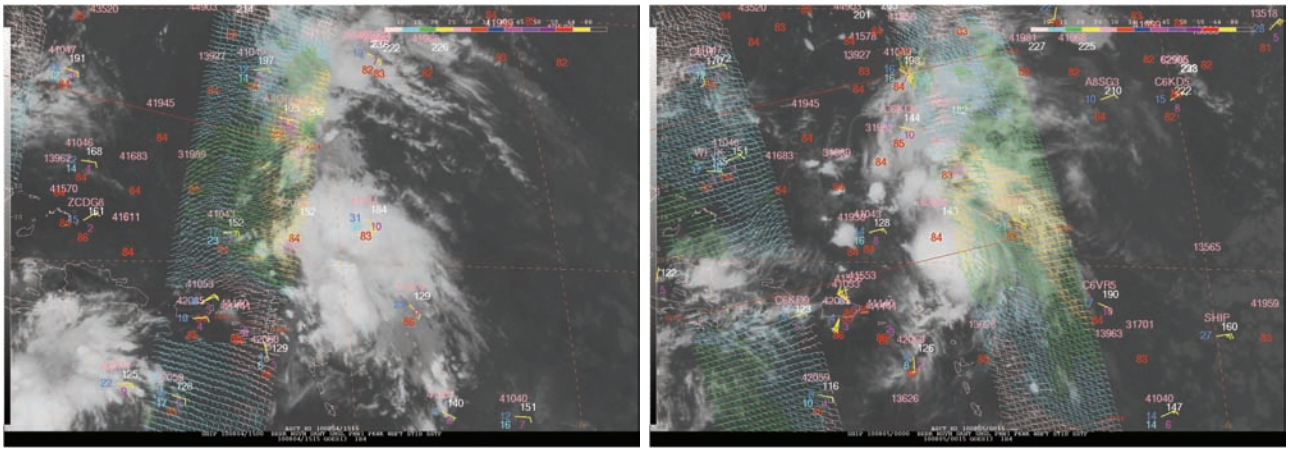


Figure 3. ASCAT pass, infrared satellite imagery from GOES-E, and ship and buoy observations from the non-tropical gale phase of the remnant low of Colin around 1500 UTC 04 August (left) and around 0000 UTC 05 August (right). Note in the increase in organization of the convection associated with the system with time.

Table 2. Eastern North Pacific cross-equatorial swell events 01 May 2010 and 31 August 2010.

Onset of 18s period swell	Peak Period	Maximum Wave Height	Duration of 18s period swell
1200 UTC 11 May	20s	12 ft	72 hours
1200 UTC 24 May	19s	11 ft	60 hours
1200 UTC 10 June	20s	11 ft	84 hours
1200 UTC 30 June	22s	12 ft	144 hours
0000 UTC 11 July	22s	9 ft	252 hours
0000 UTC 18 August	19s	12 ft	168 hours

Notice that the wind field north of the system shrinks between 1500 UTC 04 August and 0000 UTC 05 August as Colin begins to reorganize and winds at Caribbean Integrated Coastal Ocean Observing System Buoy 41053 on the southwest side of the system near the north coast of Puerto Rico shift from northeasterly to northwesterly. The Geostationary Operational Environmental Satellite East (GOES-E) infrared imagery seen in *Figure 3* also shows consolidation of the convection associated with the remnants of Colin over time. The next ASCAT pass on 05 August at 1342 UTC showed that Colin had once again regained a coherent low-level center. An Air Force Reserve Hurricane Hunter reconnaissance flight later that day sampled 50-52 kts 500 ft flight level winds in the east semicircle and the Stepped Frequency Microwave Radiometer measured winds near 40 kts at the ocean surface. Based on the sum of this information, tropical cyclone advisories were reinitiated by the NHC Hurricane Specialist Unit for Tropical Storm Colin at 2100 UTC on 05 August.

Eastern North Pacific Ocean to 30N and East of 140W

There were no gale warnings issued for the TAFB AOR in the eastern North Pacific between 1 May and 31 August 2010. However, there were several long period cross-equatorial swell events stemming from powerful fall and winter southern hemisphere storms. Table 2 documents the significant cross-equatorial swell events with periods over 18 seconds. Swell generally moves northeastward from these storms before entering the southwestern or south-central portion of the TAFB AOR. Swell from such systems typically propagates around the Galapagos Islands toward the coast of Central America and Mexico and can impact the entire TAFB AOR. *Figure 4* shows the frequency of the dominant swell direction during the month of August at San Nicolas Island, California, just north of the TAFB AOR near 33.1N 119.5W. Note that the dominant swell direction was from the south and south-southwest and had a period generally between 15-20 seconds.

The longest event during the period lasted from 11-21 July. It stemmed from a series of storm force wind events in the South Pacific. The ASCAT depiction of the wind field over the Pacific on 11 July is shown in *Figure 5*. Note the large area of gale and near gale force winds found south of 20°S, a common occurrence during the months of May-August of 2010.

The first long period swell event moved into the TAFB AOR on 11 May. 18-20 second period southwesterly swell

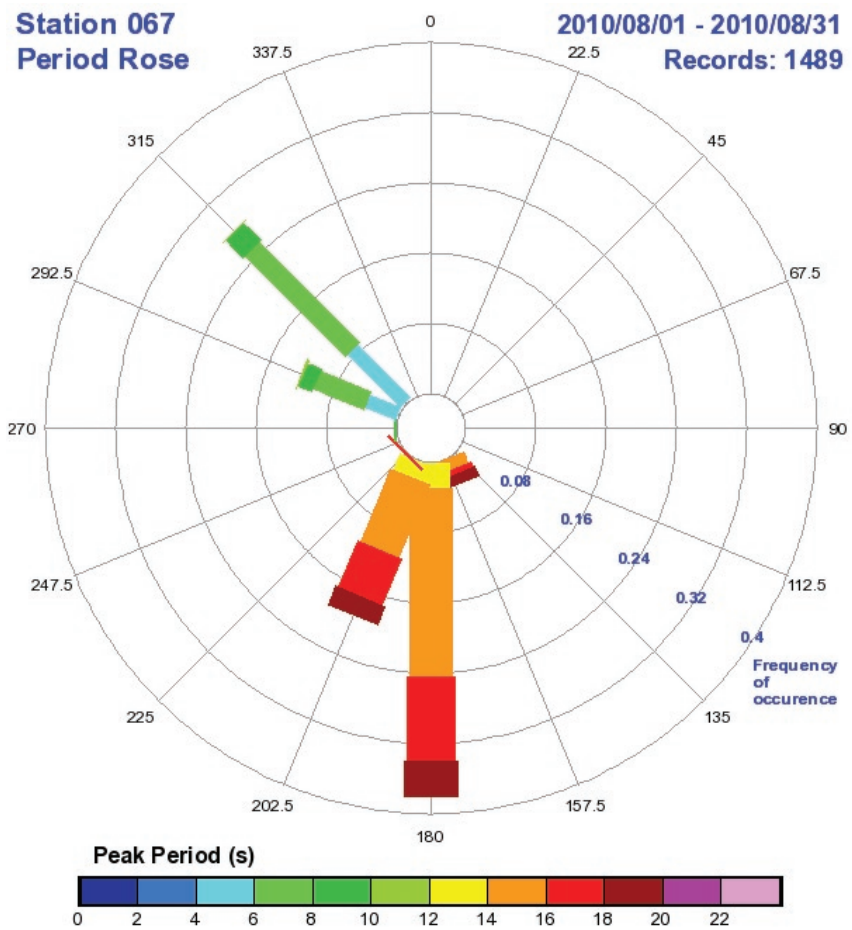


Figure 4.
Wave period rose for San Nicolas Island, California (Station 067; NDBC Identifier 46219) for the month of August 2010. The wave period rose shows the primary swell direction on the compass rose, the peak period of that swell based on the color legend below, and the frequency of occurrence of a particular swell direction and period based on the length of the colored area from the center of the compass rose. (Credit: Scripps Institution of Oceanography, Integrative Oceanography Division, Coastal Data Information Program)

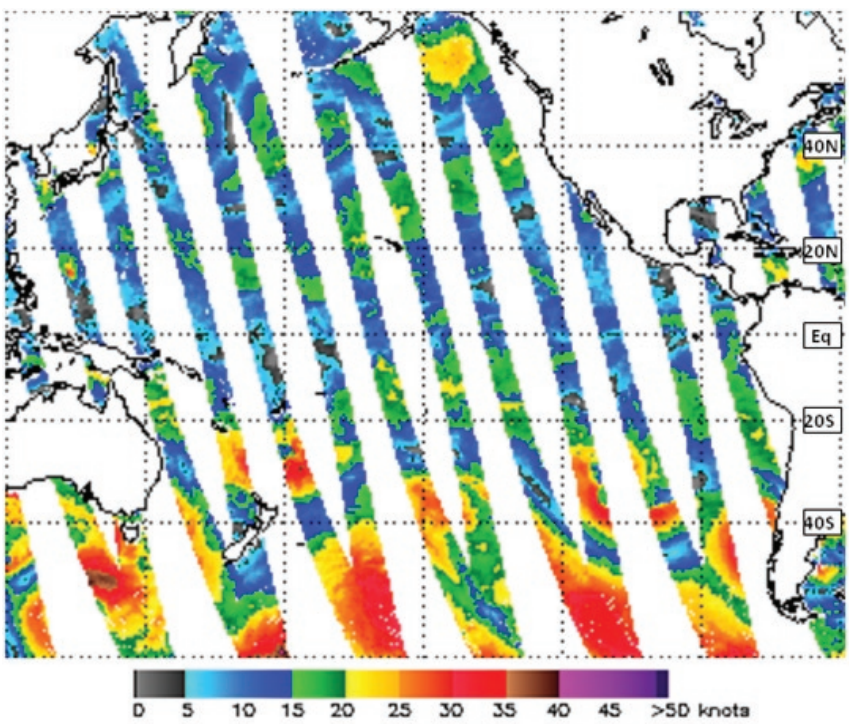


Figure 5.
ASCAT ascending passes over the Pacific Ocean on 11 July 2010 (Credit: National Environmental Satellite, Data, and Information Service's Center for Satellite Application and Research)

was forecast to hit the coast of Central America by Mexico by 0000 UTC May 14 as seen in *Figure 6*.

On 23 June 2010, TAFB modified the look of their wave period charts to be more consistent with their sister office, OPC. An example of the black and white fax version of this new format is shown in *Figure 7*. This figure highlights conditions during last occurrence of 18s period swell observed during August 2010. A comparison of *Figures 6 and 7* shows that the new format provides more evenly spaced wave period and swell information across the AOR. This is particularly useful when the fax chart is only partially received. TAFB hopes that this change is an improvement in services to our users at sea. ⚓

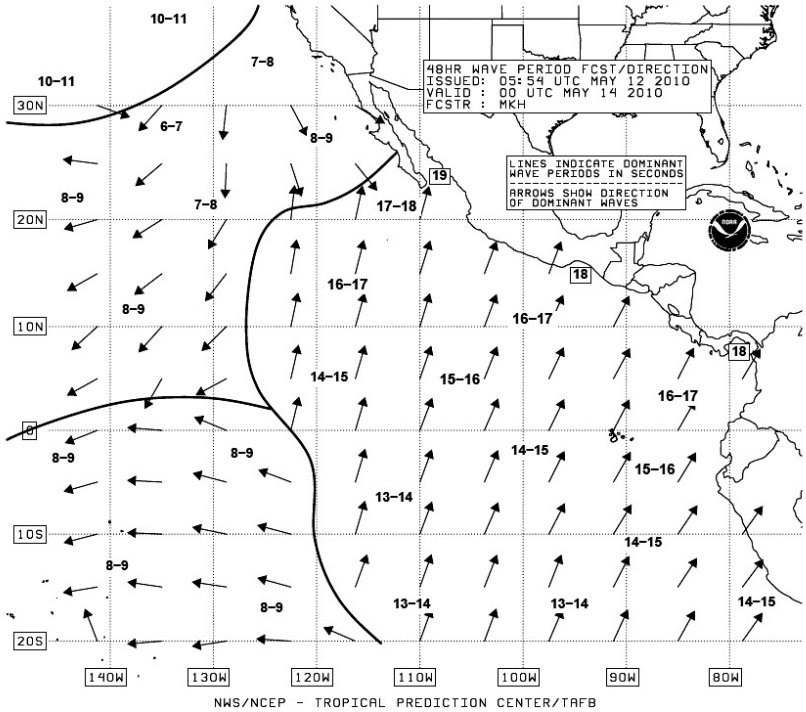


Figure 6. TAFB 48 hour Wave Period forecast chart valid 0000 UTC 14 May 2010.

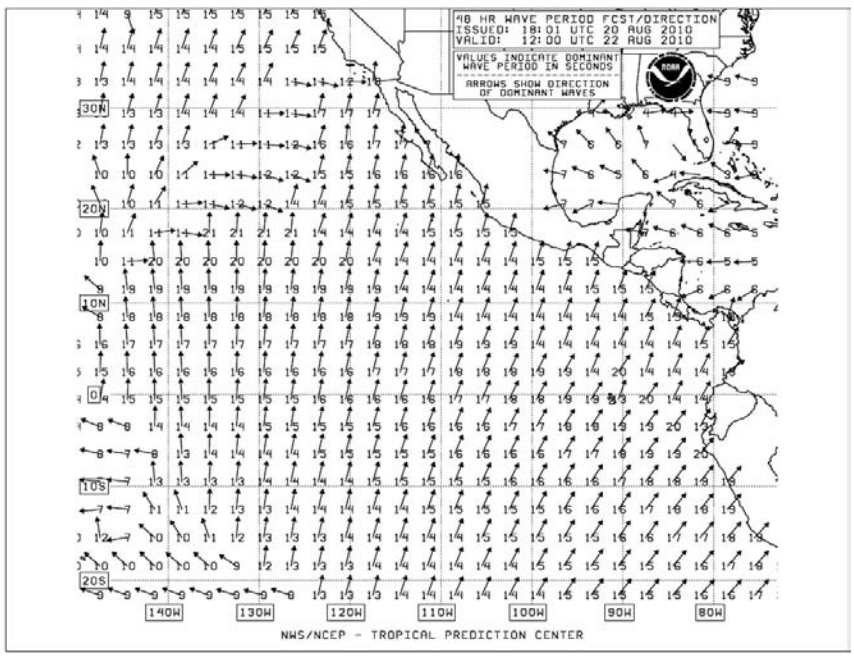


Figure 7. TAFB 48 hour Wave Period forecast chart valid 1200 UTC 22 Aug 2010.

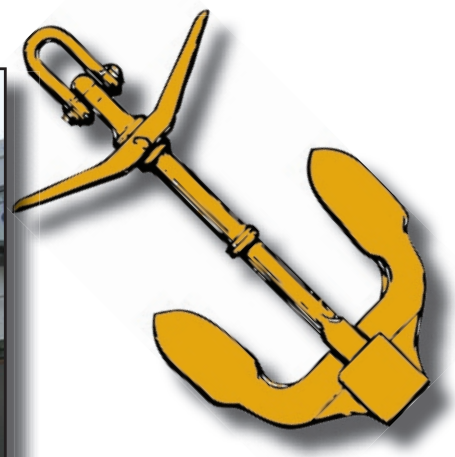
References

Spruill, Fiona ed. "Gulf of Mexico Deepwater Horizon Oil Spill (2010)". New York Times: Times Topics. 2010. [http://topics.nytimes.com/top/reference/timestopics/subjects/o/oil_spills/gulf_of_mexico_2010/index.html]. Updated September 20, 2010.

Sustained Observing Excellence Awards

Master of the WESTWOOD COLUMBIA Arjun Singh accepts a five year outstanding performance award.

Horizon Kodiak received their 5 Year Sustained Superior Performance Award in Anchorage Alaska on September 7, 2010. Pictured from left to right are:
Chief Mate: Erik Williamson
3rd Mate: Mitka Alexander Von Reis Crooks



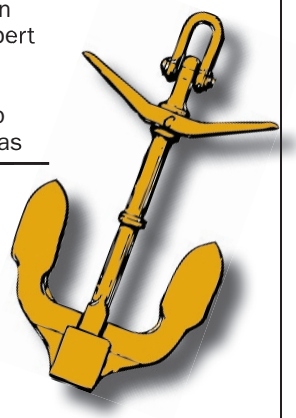
Chief Mate Dawai Chang received Horizon Tacoma's Special 5 Year Sustained Superior Performance Award at the Port of Anchorage on August 31, 2010.

Sustained Observing Excellence Awards

The Horizon Producer received their 5 year Pennant.

Left to Right: 2nd Mate Kevin Comeau, Captain Mark Ruppert

Not Shown: Chief Mate Chris Danilek, 2nd Mate Bob Anderson, 3rd Mate Pet Tupas



The crew of the Polar Spirit received their 5 Year Sustained Superior Performance Award in Nikiski Alaska on September 4, 2010. Pictured from left to right are:

Chief Officer: F. Borrello
2nd Officer: G. Nifosi
Captain: G. D'Agonstino
2nd Officer: G. Faldetta

The Horizon Challenger is awarded the VOS Pennant for receiving the annual VOS Award for 5 consecutive years 2003 to 2007. Great job!!

Thanks for the continued support. Pictured 3/M Hector Rodriguez and Chief Mate George Darley.

VOS Program Awards

VOS 2009 Award presented to the SEA-LAND EAGLE. Pictured left to right: 2nd Mate Francisco Medal, Ch Mate John Kelly, Master JP Brennan, 3rd mate George Cutacache, PMO Chris Fakes. Also contributing during 2009: Captains: Peter Mitchell, David McLean, Ch Mates: Mike La Maina, John Malone, 2nd Mate: Sean Gengras, Ross Schramm, Terry Williams, Anderson Warwick; 3rd Mates: William Heaps, Peter Luhn, Deck Cadet Nicholas Terek, Deck Cadets: Bryan Yarde, Pua Ah Mai

SEALAND RACER receives the VOS 2009 Award for outstanding performance.
Left to Right: 2/M Scott McGreough 3/M Terry Williams, Captain Jon Pratt, C/M Steven Watt

The Philadelphia Express has been awarded the 2009 VOS award for outstanding contribution to the Marine Observing program. She provided over 1300 quality and timely observations in 2009. This is 4th consecutive yearly VOS award the crew of the Philadelphia Express has won. Great job!!! Pictured left to right: 2/M Mark Meyer, C/M Chuck Rau, 3/M Jeremy Cunningham & Capt. Scott Putty. Also participating throughout the 2009 year were Capt. Dave Sulin, C/M Chris Hendrickson, 2/M Brendan Smith, 2/M Charles Orr, 2/M Barrett Newman, 3/M Ryan Wood, 3/M Chris Moore, 3/M Chris Duda & Deck Cadets Kevin McDermott, Matt Francis, Michael Dybvnik.

The EXMAR Shipmanagement LNG vessel EXCALIBUR has been awarded the annual VOS Award for 2009. This is the ship's first award. In 2009 Excalibur provided over 600 timely and high quality observations, many of which were extremely valuable during the Tropical Storm season. NOAA wishes to thank EXMAR, Excalibur and the crew for their superior performance in 2009. Pictured left to right: App. Off. Stijn De Herdt, 2nd. Off. Francois De Jonckheere, Ch. Off. Juraj Jovic, Master Yves Weemaels, 2nd Off. Dujo Jukic, 2nd Off. Loic Sinquin, 3rd Off. Meghane Bleu, and of course King Arthur's Sword.

VOS Program Awards

VOS award for Alaska Mariner

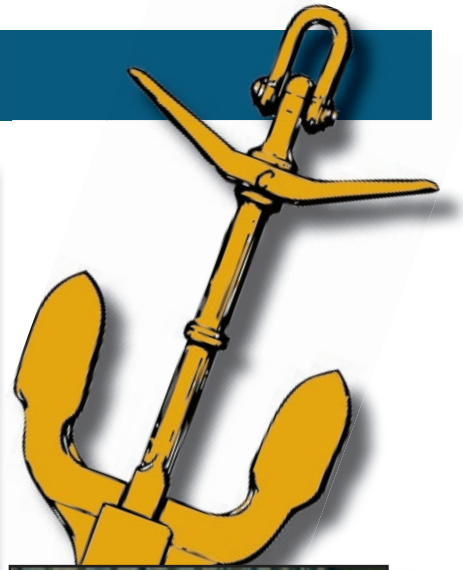
WASHINGTON EXPRESS Receiving the 2009 VOS Award, right to left: Christopher Funke Third Mate, Richard Boullion Chief Mate, and Trevor Battles Second Mate. This is the Washington Express first award.

St Louis Express continues to be one of the VOS top performers. In 2009 the crew provided nearly 4000 quality observations. This is the ship's third consecutive award. Pictured Mary E. O'Brien Chief Mate and S. Forrest Halley Second Mate. Not pictured but contributed to the ship's effort, Captains: Robert Strobel and William Miles, Chief Mate Peter Curtis. Thanks also to numerous MM&P 2nd and 3rd mates and deck cadets

The Antonis I. Angelicoussis won a 2009 VOS Award with a total of 1,893 marine observations! This was an all time new ship record and good for 2nd place in the Chevron Fleet! Pictured left to right: Alex Nagares Lusande - 3rd Officer and Neven Miskovic - 2nd Officer

VOS Program Awards

2009 VOS Award Winner, Celebrity MERCURY. From left to right: Apprentice Deck Officer - Daxenus Nopre, 2nd Officer - Ivan Gargalicana, Safety Officer - Valeriy Ignatyev, Cadet Observer - Michal Kordecki, Captain - Konstantinos Nestoroudis, Staff Captain - Damianos Xenakis, Chief Officer-Navigation - Vladislav Balev, Apprentice Deck Officer - Edgars Embergs, 2nd Officer - Evangelos Saitis



Captain John Nicoll accepts the 2009 VOS Annual Award on behalf of the crew of the HORIZON TRADER, which produced 1171 high quality observations during 2009. Thanks and Congratulations!

Pictured left to right: D/C Luis Gonzalez, C/O Celso Amazona, Max Quiros who took the majority of the ship's 1667 quality observation in 2009. Thanks for a job well done. Congratulations on winning the 2009 VOS Annual Award.

Master james kelleher and crew of the Horizon Reliance receive annual award

VOS Program Awards

Azamara Journey won a 2009 VOS Award with a total of 798 marine observations! This was a new ship's record. Starting from left to the right: 2nd Officer: Llewellyn, Albion Cassius; Chief Officer/Navigation: Arbilias, Kosmas; Chief Officer/Deck: Thomasson, Per; 2nd Officer: Kutsenko, Roman; Assistant Officer On Watch: Druetta, Joaquin

Al Marrouna won a 2009 VOS Award with a total of 839 valuable marine observations! This was a new ship's record and good for #1 in the Teekay Fleet! Pictured from left to right: 3rd Officer Ulysses Silva, Chief Officer Leo Giacic & 2nd Officer Danijel Kaliterna. Second from right, holding the plaque, is Captain John Burton. Not pictured but participating in the award winning performance: 2nd Officer Tonci Zuvan; 2nd Officer Russell Ablian; 2nd Officer Boris Puljas; 2nd Officer Simon Hogan, 3rd Officer Tony Louis-Justin; Chief Officer Hrvoje Kralj; 2nd Officer Henry Penano; Deck Cadet Fandy Irawan; Deck Cadet Laura Chisholm; Chief Officer Randeep Randhawa; Captain Stephen Tucker

Pictured from left to right: Pavel Grigorenco DPO, Brent Yockel DPO, Capt Mike Galati, Will Wiggins Sr. DPO, Paula Rychtar PMO, Mike Schultz Sr. DPO, Heather Thompson ADPO. Not pictured: Nathan Prather DPO, Scott Beck Sr. DPO, Capt Benjamin Dinsmore, C/M Tracy Steele, C/M Paul Murk.

This will be the 6th consecutive VOS Award for the DISCOVERER DEEP SEAS. In addition to receiving a VOS Award for outstanding performance, the DDS has earned the 5 Year Consecutive VOS Outstanding Performer Award. Congratulations!

The Crew of the LNG Gemini won a 2009 VOS Award and Plaque with an outstanding total of 984 valuable marine observations! Pictured are Master: Capt. Tomislav Vidakovic; Chief mate: Bozo Jakobovic; 2nd/M: Mate Vladovic; 3/M: Ivo Rakela; 3/M: Robert Bajo

VOS Program Awards

2nd Mate Michael Kinzie and 3rd Mate Nicholas Retelas receive annual Award for APL Korea

Celebrity Millennium won a 2009 VOS Award with a total of 1,884 marine observations. This was an all time new ship's record and good for 2nd place in the Celebrity Fleet! From left to right: 2nd officer, ANASTASIOS TASOULIS; 2nd officer, Cristina Olteanu; Staff Captain, XENOFON LIVANIOS; apprentice officer, Andrada Staneata; Navigation officer, Spyros Margaritis; apprentice officer, Vio Matucinovic

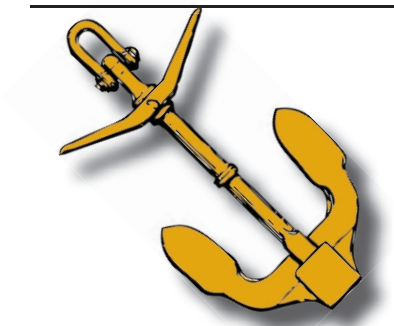
The Norwegian Sun won a 2009 VOS Award and Plaque with an outstanding total of 2,434 valuable marine observations! This was an all time new ship and NCL record!

LNG Libra won a 2009 VOS Award with 977 marine observations. Pictured from left to right, Third Mate Dejan Milojevic, Chief Mate Sasa Grk, Captain Jakov Besjedica, Second Mate Zeljko Jelaska, and Third Mate Kresimir Mucic.

VOS Program Awards

Norwegian Jade won a 2009 VOS Award with a total of 962 valuable marine observations! Pictured: Captain Haavard Ramsoey – sitting right; Staff Captain Steve Tepper – sitting left; Standing from right to left – 3rd Officer Dean Tominic, First Officer/Navigation Kaloyan Nedyalkov, Chief Officer Niklas Nordlund, First Officer/Safety Ryan Martinez, 2nd Officer Jade Sarong.

C/O Nick Marcantonio accepts the 2009 VOS annual award on behalf of the Captain and crew of the MAERSK MONTANA who contributed more than 750 quality weather observations. Thanks and Congratulations!



AB Apporro Osario and Cadet Alex Hernandez receive annual award for Horizon Reliance.

Noordam won a 2009 VOS Award with 1,397 marine observations! Pictured left to right: Lynette Bryson – cadet Officer; Sean Gill – 2nd Officer; Rachel Hope - Cadet Officer; Eric van der Wal – Chief Officer; Leon van der Knaap – 2nd Officer; Wouter Koolhaas – 3rd Officer; GeertJaap van der Knaap – 1st Officer; Dalton Rickly - Cadet Officer; Michael Hassan – Cadet Officer; Matthew Hudson – 3rd Officer; Jelle Cnossen – 4th Officer; Nelson Fernandes – 4th Officer

VOS Program Awards

The Horizon Producer crew receiving the 2009 Annual Award. Pictured from left to right: Chief Mate Manuel Ramos; Deck Cadet Elise Terry; 2nd Mate Bob Anderson. Not Shown: Captain William Boyce; Chief Mate Chris Danilek, 3rd mate Pete Tupas

Norwegian Star won a 2009 VOS Award with a total of 818 valuable marine observations! This was a new ship's record! Pictured from left to right are: Staff Captain Peter Engwall; 1st Officer Safety Jiji Pullocheril; 2nd Officer Roger Biri; Captain Gunnar Hammerin; 1st Officer Navigation Sanjeev Kaushik; 2nd Officer Richard Desalesa; Chief Officer Per Abbe; Chief Officer Mats Nordberg

Norwegian Pearl won 2009 VOS Award with a total of 798 marine observations. This was a new ship's record! Pictured from left to right are: Chief Officer Andrzej Kwitowski; Security Officer Sven Venstroem; Staff Captain Ziljko Jurac; Safety Manager David Leng; 2nd Officer Resituto Padilla; 1st Officer (navigator) Sandeep Patil

VOS Program Awards

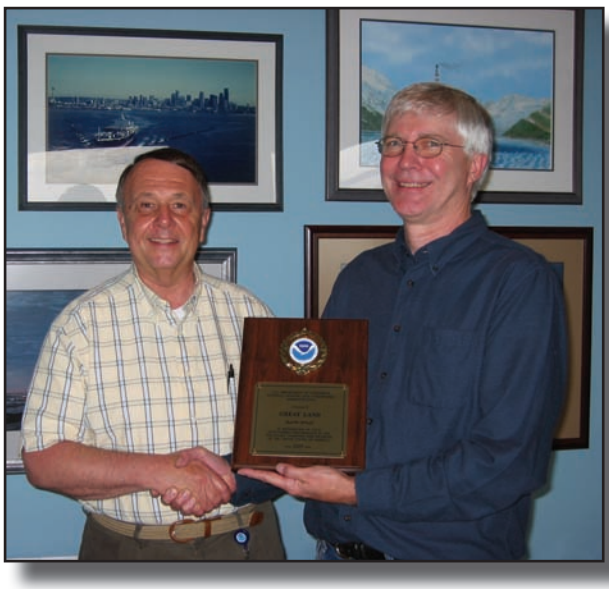
Pictured left to right: Captain Chris Kavanagh, 2nd Officer Eric Cutler, Chief Officer Brandt Hager, Not Pictured 3rd Officer Joe Goldstein. Accepting the 2009 VOS Annual Award on behalf of the Crew of the MAERSK OHIO. The ship contributed over 1000 quality observations during 2009. Thanks and congratulations!

Pictured from left to right: Second Mate - Perlas, Jay A., Third Mate - Saura, Albert V., Master - Queturas, Romulo M., Chief Mate - Bilbao, Rosbillo S. Brgds

The VOS award for NOAA Ship OSCAR DYSON. Pictured left to right are: ENS Faith Opatrny, LT Sarah Duncan, LT (jg) Paul Chamberlain, LT Jeff Shoup, ENS Russell Pate, CDR Mike Hoshlyk, 1st Asst Eng Jerry Sheehan, Skilled Fisherman Dennis Boggs

1/O Daniel Donovan, 2/O Nathaniel Zike, 3/O Park Tupper And 3/O Brendon Ball receive annual award for Overeseas Los Angeles

VOS Program Awards



Bill Taylor of TOTE Shipping Company accepts a 2009 VOS Award for the GREATLAND. The vessel has been in service between Tacoma and Alaska for the past 35 years

3rd Mate Russel Torcato and 2nd Mate Clyde D'Sa accept induction award into the US VOS Program Aboard APL Washington.

Master Frank Warnekros, 1/O Michael Carolan and 2/O Daniel Hall receive annual award for Sea-Land Comet

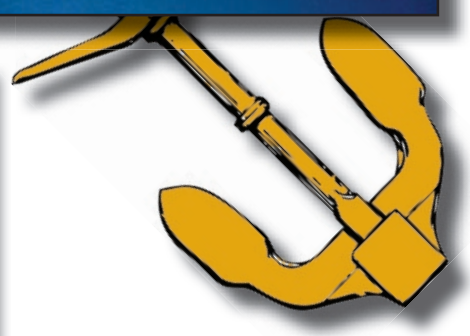
The Volendam observing team received their 2009 VOS Award and Plaque in Juneau Alaska on June 18th. They had an outstanding total of 4,192 valuable marine observations! This was the highest total of any ship in the USA VOS Program and a new all time new ship's record! They also transmitted around 100 marine mammal observations from Alaskan waters and elsewhere. Pictured are: 3rd Officer Laura Burden; QM Madjid Almassysy; QM Wein Beligo; QM Achmad Suhada; QM Edi Sutrisno; 2nd Officer Andre Martin; Cadet Amy Whitcombe; 4th Officer Vikki Bacchioni; QM Fauzi Bin Haja Munawar; Chief Officer Oebele W. Van Hoogdalem; 3rd Officer Jennifer Colwell; 1st Officer Laurentius Van Eerten; Captain Pieter Bos

VOS Program Awards

2nd Mate of APL Singapore receive Annual Award

BGT receiving their company 2009 VOS Award along with awards for 5 of their outstanding observing ships. Well Done! Pictured from left to right are: Jim Luciani – New York PMO, Eric Linsner – Senior Vice President at PSM, Wanda Aponte – Admin Assistant BGT, John Wasserman – VOS Operations Manager, and Nigel Vass – Vice President of Operations at BGT

The Holland Statendam receiving their award. Pictured from left to right: Sajith Kumar; Terence Tak; James Laurent; Liam O'kane; Dale Hope; Samuel James; Elianne Rongen; Chief Officer Jeroen Schuchmann; Alexander Chalk; Rakesh Kumar; Master Frans Consen; Dirk van Aarsen.



Celebrity Solstice received a 2009 VOS Award with an outstanding total of 1,186 valuable marine observations! This was an all time new ship's record!

VOS Program Awards

Zuiderdam won a 2009 VOS Award with a total of 1,484 valuable marine observations! This was an all time new ship's record! Pictured from left to right: Quartermaster Reza Irvianto; 3rd Officer Beuito Graanoogst; 3rd Officer George Hale; Chief Officer Michiel Willems; 2nd Officer Wiebe Sijperda

VOS Award presented to WESTWOOD RAINIER. Pictured left to right are: cadet Virendra Rathore, Third Officer Benjamen Ajoc, Third Officer Rakesh Kumar, Captain Arjun Singh, Second Officer Lyndon Cardoso, Chief Officer Vishal Srivastava.

Zaandam won a 2009 VOS Award with a total of 1,729 marine observations. Pictured from left to right: Chief Officer Jan van den Nouland; 1st Officer Igor Thijm; 4th Officer Thijs Meuger.

The Crowley Tug Sinuk was proud to display their newly awarded AMVER Pennant during this July 2010 photo in Alaskan waters. Captain Bernie Meier is on the left.

National Weather Service VOS Program New Recruits:

July 1 through October 31, 2010

SHIP NAME	CALL SIGN
Alaska Titan	WDE4789
Algobay	VCPK
APL Hong Kong	A8AM6
Arcturus Voyager	C6YA7
Arsos	5BAQ2
Bismarck Sea	WDE5016
Capelin	KF006
Clipper Sun	C6XB2
Defender	WBN3016
Eships Bainunah	ZDIQ7
Federal Asahi	VRWG3
FMG Cloudbreak	ONFW
FMG Matilda	ONFN
Front Kathrine	V7QX2
Genco Acheron	VRCF7
Genco Augustus	VRDD2
Genco Claudius	V7SY6
Genco Constantine	VRDR8
Liberty Promise	WWMZ
Lowlands Orchid	ONFP
Maersk Jubail	VREN8
Maersk Tarragona	A8NH4
Michipicoten	CFG8060
Mindanao	S6SR
Nieuw Amsterdam	PBWQ
Northern Justice	A8SZ8

SHIP NAME	CALL SIGN
Overseas Anacortes	KCHV
Pacific Innovator	3ESE7
Robert Gordon Sproul	WSQ2674
S/V Denis Sullivan	WDA2619
Saga Andorinha	MYNJ6
Serac	KF007
Star Kinn	LAJF7
Umang	A8PF6

34 NEW RECRUITS! WAY TO GO!!!

VOS Cooperative Ship Report:
July through October 2010

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Adam E. Cornelius	WCY9870	Duluth	1	0	0	0	0	0	0	0	0	0	0	0	1
Advantage	WPPO	Norfolk	28	23	22	31	14	0	30	57	41	36	0	0	282
Adventure Of The Seas	C6SA3	Miami	327	264	349	190	344	313	342	313	333	337	0	0	3112
Adventurer	WBN3015	Jacksonville	0	0	0	0	0	0	1	11	11	11	0	0	34
Ajax	C6TZ6	San Francisco	0	0	0	0	7	27	13	7	5	0	0	0	59
Al Daayen	C6VF7	Anchorage	47	31	30	7	0	0	2	11	5	0	0	0	133
Al Huwaila	C6VG2	Anchorage	17	25	2	0	0	0	0	0	0	0	0	0	44
Al Khuwair	C6VM6	Anchorage	0	11	9	2	1	11	0	23	23	0	0	0	80
Al Marrouna	C6VF5	Anchorage	82	78	72	79	70	68	68	43	49	33	0	0	642
Alaska Mariner	WSM5364	Kodiak	23	0	0	0	0	54	62	216	11	20	0	0	386
Alaska Spirit	WCC5414	Valdez	0	0	1	0	0	0	0	0	0	0	0	0	1
Alaska Titan	WDE4789	Kodiak	0	0	0	0	0	2	0	1	0	0	0	0	3
Alaskan Explorer	WDB9918	Valdez	62	51	59	139	63	39	85	67	37	9	0	0	611
Alaskan Frontier	WDB7815	Valdez	60	37	41	18	33	16	16	15	60	72	0	0	368
Alaskan Leader	WDB7918	Kodiak	0	0	1	0	0	0	0	0	0	0	0	0	1
Alaskan Legend	WDD2074	Valdez	29	60	109	70	27	61	48	49	46	24	0	0	523
Alaskan Navigator	WDC6644	Valdez	38	14	34	7	1	0	0	0	15	74	0	0	183
Albemarle Island	C6LU3	Miami	61	47	29	15	39	31	44	34	37	33	0	0	370
Alert	WCZ7335	Valdez	8	2	31	0	1	0	1	0	2	8	0	0	53
Algobay	VCPK	Duluth	0	0	0	0	0	0	0	2	0	0	0	0	2
Algocape	VGJC	Duluth	0	0	0	0	1	23	22	6	8	0	0	0	60
Algolake	VCPX	Duluth	0	0	0	38	147	184	81	79	23	43	0	0	595
Algomarine	VGJV	Duluth	0	0	0	0	0	0	3	35	5	13	0	0	56
Algorail	VYNG	Duluth	0	0	0	0	0	3	0	7	12	1	0	0	23

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Algosoo	VGJD	Duluth	0	0	0	0	0	0	0	1	0	0	0	0	1
Algoway	VDFP	Duluth	0	0	0	0	23	23	12	2	15	12	0	0	87
Algowood	VCTD	Duluth	0	0	0	0	0	0	0	5	0	25	0	0	30
Alliance Beaumont	WKDY	Houston	0	0	8	84	80	80	23	43	80	49	0	0	447
Alliance Charleston	WRAH	Charleston	0	0	30	29	74	23	48	59	56	57	0	0	376
Alliance New York	KDUE	Jacksonville	23	0	48	15	14	18	4	25	15	38	0	0	200
Alliance Norfolk	WGAH	Houston	0	0	0	10	2	2	5	6	0	0	0	0	25
Alliance St Louis	WGAE	Charleston	10	17	6	2	31	47	10	3	21	3	0	0	150
Alpena	WAV4647	Duluth	0	0	0	10	0	2	6	8	20	60	0	0	106
Altair Voyager	C6OK	Baltimore	4	0	0	15	32	27	34	22	1	0	0	0	135
American Century	WDD2876	Duluth	40	0	0	168	176	249	310	281	125	315	0	0	1664
American Integrity	WDD2875	Duluth	1	0	0	1	19	102	128	105	58	76	0	0	490
American Mariner	WQZ7791	Duluth	11	0	3	25	22	12	98	62	12	8	0	0	253
American Republic	WYR5386	Duluth	0	0	0	0	0	8	5	0	0	0	0	0	13
American Spirit	WCX2417	Duluth	8	0	0	1	5	5	8	25	11	15	0	0	78
Amsterdam	PBAD	Anchorage	57	48	24	44	43	40	54	41	20	41	0	0	412
Andromeda Voyager	C6FZ6	Anchorage	0	14	25	3	19	15	0	9	0	6	0	0	91
Angeles	A8SF5	New York City	0	0	0	0	0	0	23	0	0	0	0	0	23
Antares Voyager	C6PZ3	Anchorage	21	38	38	59	6	42	79	57	43	42	0	0	425
Antonis I. Angelicoussis	APL C6FP5	Anchorage	69	112	73	38	21	11	2	8	29	62	0	0	425
Antwerpen	VRBK6	Anchorage	0	0	13	45	23	46	48	39	13	20	0	0	247
APL Agate	WDE8265	New York City	15	18	8	0	3	32	26	44	38	41	0	0	225
APL Belgium	9VKQ3	Los Angeles	82	56	35	56	52	28	32	12	33	23	0	0	409
APL Cairo	S6HU3	Anchorage	47	10	0	0	0	0	0	0	0	0	0	0	57
APL China	WDB3161	Los Angeles	73	13	14	42	43	40	46	51	44	67	0	0	433
APL Cyprine	WDE8293	Charleston	11	28	55	38	34	24	12	7	0	16	0	0	225
APL England	9VDD2	Anchorage	79	47	68	47	87	64	58	87	52	56	0	0	645
APL Garnet	9VVN	New York City	0	6	30	26	60	32	27	9	0	16	0	0	206

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
APL Hong Kong	A8AM6	Seattle	0	0	0	0	0	0	1	0	0	0	0	0	1
APL Ireland	A8BK6	Seattle	0	0	0	0	33	67	32	35	33	0	0	0	200
APL Japan	WDE8288	New York City	29	32	14	45	52	31	30	32	53	54	0	0	372
APL Kennedy	9VAY4	Charleston	21	28	28	36	27	32	27	56	1	34	0	0	290
APL Korea	WCX8883	Los Angeles	56	62	99	0	167	151	49	18	35	154	0	0	791
APL Pearl	WDE8264	New York City	49	63	83	95	106	70	73	71	74	84	0	0	768
APL Philippines	WCX8884	Los Angeles	1	33	27	27	65	35	33	47	47	48	0	0	363
APL Scotland	9VDD3	Los Angeles	72	79	70	90	56	69	24	49	80	63	0	0	652
APL Singapore	WCX8812	Los Angeles	58	19	38	53	49	6	0	35	37	37	0	0	332
APL Spain	A8EH8	Seattle	0	0	0	0	7	10	3	7	0	0	0	0	27
APL Spinel	9VVK	New York City	49	35	30	47	58	54	69	42	70	57	0	0	511
APL Texas	VRFH2	Los Angeles	22	17	0	4	0	2	0	0	7	1	0	0	53
APL Thailand	WCX8882	Los Angeles	24	37	37	31	12	35	12	36	41	27	0	0	292
APL Turquoise	WDF2642	New York City	73	68	55	59	77	73	31	36	56	40	0	0	568
APL Washington	VRFD6	Los Angeles	0	0	0	0	8	38	43	0	0	0	0	0	89
Aquarius Voyager	C6UC3	Jacksonville	16	2	24	11	23	9	25	65	5	33	0	0	213
Arctic Bear	WBP3396	Kodiak	0	0	0	3	17	0	0	0	1	0	0	0	21
Arctic Ocean	C6T2062	New York City	46	0	13	39	26	29	23	31	34	48	0	0	289
Arcturus Voyager	C6YA7	Anchorage	0	0	0	0	0	0	5	15	41	11	0	0	72
Aries Voyager	C6UK7	Anchorage	39	71	61	84	56	36	44	0	0	1	0	0	392
Arthur M. Anderson	WE4805	Duluth	0	0	41	193	225	303	303	237	324	261	0	0	1887
Athenian Phoenix	3FPR6	Anchorage	165	75	81	44	0	0	0	0	0	0	0	0	365
Atlantic Cartier	SCKB	Norfolk	43	40	33	39	42	33	30	46	45	40	0	0	391
Atlantic Explorer (Aws)	NWS0021	Anchorage	49	195	172	216	253	201	224	209	264	397	0	0	2180
Atlantic Frontier	VRDJ7	Anchorage	0	0	0	0	0	0	7	15	15	1	0	0	38
Atlantic Grace	VRDT7	Anchorage	29	23	29	23	0	0	0	0	0	0	0	0	104
Atlantic Ocean	C6T2064	New York City	30	27	29	33	21	20	15	14	24	27	0	0	240
Atlantic Rose	VREF7	Anchorage	6	0	0	0	0	4	0	0	0	2	0	0	12

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Atlantis (Aws)	NWS0020	Kodiak	737	660	732	680	724	655	701	713	700	717	0	0	7019
Attentive	WCZ7337	Valdez	0	23	191	84	1	0	0	0	0	11	0	0	310
Aurora	WYM9567	Valdez	0	0	0	40	116	252	326	322	78	116	0	0	1250
Aware	WCZ7336	Valdez	17	2	4	0	0	2	2	0	2	3	0	0	32
Axel Spirit	C6FY5	Anchorage	62	5	15	32	65	58	50	77	69	29	0	0	462
Azamara Journey	9HOB8	Anchorage	108	93	115	91	50	62	79	89	63	65	0	0	815
Azamara Quest	9HOM8	Anchorage	54	78	45	76	71	44	78	90	67	58	0	0	661
Badger	WBD4889	Duluth	0	0	0	0	0	69	89	87	46	6	0	0	297
Barbara Andrie	WTC9407	Duluth	0	0	0	9	13	16	25	14	17	40	0	0	134
Barbara Foss	WYL4318	Kodiak	0	0	0	3	2	7	4	0	0	2	0	0	18
Barrington Island	C6QK	Miami	37	18	26	26	26	45	45	42	29	43	0	0	337
Bell M. Shimada	NWS0025	Seattle	0	0	2	0	273	82	496	261	390	214	0	0	1718
Bell M. Shimada (Aws)	NWS0025	Seattle	0	0	2	0	273	82	496	261	390	214	0	0	1718
Berge Nantong	VRBU6	Anchorage	0	0	4	0	3	10	29	23	32	10	0	0	111
Berge Ningbo	VRBQ2	Anchorage	24	0	0	0	7	26	25	15	6	0	0	0	103
Berlian Ekuator	HPYK	Anchorage	0	0	0	37	0	0	0	0	0	0	0	0	37
Bernardo Quintana A.	C6KJ5	New Orleans	84	64	76	68	406	272	74	43	69	28	0	0	1184
Bismarck Sea	WDE5016	Kodiak	0	0	0	0	0	0	0	6	0	4	0	0	10
Blarney	WDD8603	Kodiak	0	0	0	0	0	1	0	0	0	0	0	0	1
Blue Ridge	KNJD	Miami	34	19	14	5	141	145	207	227	37	35	0	0	864
Bluefin	WDC7379	Seattle	0	0	0	2	13	21	74	199	121	0	0	0	430
Brilliance Of The Seas	C6SJ5	Miami	7	3	1	3	3	0	0	0	0	3	0	0	20
Buccaneer	WYW5588	Valdez	0	0	0	0	7	0	0	0	1	6	0	0	14
Buffalo	WXS6134	Duluth	0	0	0	0	0	0	0	0	6	1	0	0	7
Bulwark	WBN4113	Valdez	0	1	24	3	35	1	2	20	1	18	0	0	105
Burns Harbor	WDC6027	Duluth	10	0	4	78	53	14	50	29	22	86	0	0	346
California Voyager	WDE5381	San Francisco	16	27	9	12	20	14	14	4	8	1	0	0	125
Calumet	WDE3568	Duluth	0	0	0	0	2	0	1	0	4	0	0	0	7

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Camai	KF003	Kodiak	0	0	0	0	0	0	0	1	0	0	0	0	1
Canada Express	VRBW4	Anchorage	3	5	0	22	47	4	0	0	0	0	0	0	81
Canadian Enterprise	VCJM	Duluth	0	0	79	169	160	0	0	4	18	5	0	0	435
Canadian Navigator	VGMV	Duluth	0	0	0	4	25	0	0	0	0	6	0	0	35
Canadian Progress	VDRV	Duluth	40	1	0	23	24	24	19	20	15	10	0	0	176
Canadian Transport	VCLX	Duluth	0	0	0	20	43	42	42	8	32	21	0	0	208
Cap Colville	9WCX9	Anchorage	0	0	31	34	19	23	33	0	0	0	0	0	140
Capelin	KF006	Anchorage	0	0	0	0	0	0	3	6	4	0	0	0	13
Capricorn Voyager	C6UZ5	Anchorage	54	13	11	20	7	10	67	47	44	13	0	0	286
Capt. Henry Jackman	VCTV	Duluth	0	0	0	1	0	0	0	0	0	0	0	0	1
Capt. Steven L. Bennett	KAXO	New Orleans	5	8	6	5	1	10	7	0	0	0	0	0	42
Carnival Conquest	3FPQ9	Houston	37	5	3	8	43	19	31	34	21	10	0	0	211
Carnival Destiny	C6FN4	Miami	1	0	0	0	0	33	21	18	31	49	0	0	153
Carnival Dream	3ETA7	Jacksonville	22	6	17	43	51	66	60	47	45	23	0	0	380
Carnival Ecstasy	H3GR	Miami	39	25	0	3	21	23	14	10	20	7	0	0	162
Carnival Elation	3FOC5	New Orleans	48	0	38	23	20	9	12	8	12	12	0	0	182
Carnival Fantasy	H3GS	New Orleans	72	72	48	11	17	10	18	2	19	28	0	0	297
Carnival Fascination	C6FM9	Jacksonville	1	27	12	2	15	29	16	9	1	3	0	0	115
Carnival Freedom	3EBL5	Miami	134	86	51	17	69	22	17	28	12	14	0	0	450
Carnival Glory	3FPS9	Miami	37	13	31	25	1	17	33	32	21	18	0	0	228
Carnival Imagination	C6FN2	Miami	25	18	12	9	6	0	0	30	16	21	0	0	137
Carnival Inspiration	C6FM5	Miami	11	0	6	4	0	0	0	0	0	0	0	0	21
Carnival Legend	H3VT	Miami	30	26	32	19	28	25	18	13	22	11	0	0	224
Carnival Liberty	HPYE	Miami	16	1	0	29	98	72	70	92	42	18	0	0	438
Carnival Miracle	H3VS	Miami	35	33	31	11	11	48	15	4	11	21	0	0	220
Carnival Paradise	3FOB5	Los Angeles	13	9	5	2	0	0	3	16	15	18	0	0	81
Carnival Pride	H3VU	Jacksonville	97	34	7	19	9	10	8	12	11	0	0	0	207
Carnival Sensation	C6FM8	Jacksonville	23	15	15	14	17	32	44	17	0	0	0	0	177

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Carnival Spirit	3FPR9	Anchorage	0	12	29	24	8	8	17	4	52	80	0	0	234
Carnival Splendor	3EUS	Anchorage	5	2	17	9	14	5	10	13	7	102	0	0	184
Carnival Triumph	C6FN5	New Orleans	11	10	11	16	0	12	21	45	18	6	0	0	150
Carnival Valor	H3VR	Miami	4	42	43	26	46	59	70	32	30	13	0	0	365
Carnival Victory	3FFL8	Miami	53	37	63	79	31	7	20	30	43	28	0	0	391
Cason J. Callaway	WE4879	Duluth	0	0	0	4	40	56	7	71	38	19	0	0	235
Castor Voyager	C6UZ6	Anchorage	35	49	52	55	41	28	78	55	5	24	0	0	422
Celebrity Century	9HJI9	Miami	79	145	76	74	89	35	90	140	88	85	0	0	901
Celebrity Constellation	9HJB9	Miami	355	291	452	247	184	297	281	461	298	369	0	0	3235
Celebrity Eclipse	9HXC9	Miami	0	0	0	12	90	85	65	556	594	551	0	0	1953
Celebrity Equinox	9HXD9	Miami	248	230	231	280	241	175	244	194	191	200	0	0	2234
Celebrity Infinity	9HJD9	Miami	158	158	239	331	190	96	51	94	417	77	0	0	1811
Celebrity Mercury	9HJG9	Miami	244	183	129	216	230	112	131	56	107	71	0	0	1479
Celebrity Millennium	9HJF9	Anchorage	153	114	191	189	120	230	268	293	278	245	0	0	2081
Celebrity Solstice	9HRJ9	Miami	124	475	519	552	566	572	596	571	570	566	0	0	5111
Celebrity Summit	9HJC9	Miami	73	100	225	111	107	59	4	41	59	98	0	0	877
Centurion	WBN3022	Jacksonville	0	0	0	0	0	0	2	15	0	8	0	0	25
Chaconia	ONCA	Houston	25	20	11	0	11	50	35	37	0	0	0	0	189
Charles Island	C6JT	Miami	52	41	42	49	47	52	31	37	15	22	0	0	388
Charles M. Beeghly	WL3108	Duluth	3	0	0	9	4	0	3	6	0	0	0	0	25
Charleston	WBVY	Houston	1	0	1	0	0	0	0	0	0	0	0	0	2
Charleston Express	WDD6126	Houston	72	52	107	126	82	75	103	109	90	88	0	0	904
Chukchi Sea	WED2281	Kodiak	0	0	0	4	66	99	64	8	83	87	0	0	411
Clipper Sun	C6XB2	Anchorage	0	0	0	0	163	24	322	13	0	1	0	0	523
CMB Coralie	VRFT5	Anchorage	0	0	47	0	45	0	0	0	0	0	0	0	92
Commander N	A8QJ6	Anchorage	55	0	0	0	0	0	0	0	0	0	0	0	55
Commitment	WDE3894	Kodiak	0	0	0	18	0	2	25	0	0	0	0	0	45
Copenhagen Express	ZCDP2	Charleston	4	9	2	0	0	0	0	0	0	0	0	0	15

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Coral Sea	C6YW	Miami	0	0	27	1	0	0	0	0	0	0	0	0	28
Corbin Foss	WDB5265	Kodiak	82	8	0	0	0	0	0	0	0	0	0	0	90
Corwith Cramer	WTF3319	Kodiak	0	30	67	0	0	67	58	0	0	35	0	0	257
Costa Allegra	ICRA	Anchorage	0	0	1	0	39	102	87	73	121	95	0	0	518
Costa Atlantica	IBLQ	Anchorage	36	27	25	4	0	0	0	0	9	1	0	0	102
Costa Europa	IBCE	Anchorage	46	53	0	0	0	0	0	0	0	0	0	0	99
Costa Fortuna	IBNY	Miami	552	558	554	444	211	110	151	34	96	165	0	0	2875
Costa Luminosa	ICGU	Anchorage	21	36	4	0	0	0	0	0	0	0	0	0	61
Costa Magica	IBQQ	Anchorage	200	172	107	79	67	20	7	1	1	0	0	0	654
Costa Mediterranea	IBCF	Anchorage	0	0	86	239	167	151	183	363	262	418	0	0	1869
Costa Serena	ICAZ	Anchorage	7	91	110	65	5	0	0	0	0	0	0	0	278
Courage	WDC6907	Baltimore	49	30	29	21	26	35	32	24	10	22	0	0	278
Courage	WDE3893	Kodiak	25	61	21	60	41	64	4	4	24	9	0	0	313
Crowned Eagle	V7QP4	Anchorage	6	4	0	0	0	5	8	20	11	3	0	0	57
Crystal Marine	9VIC4	Anchorage	13	6	7	8	8	21	2	86	90	95	0	0	336
Crystal Serenity	C6SY3	Anchorage	21	54	3	2	0	0	0	0	1	0	0	0	81
Cygnus Voyager	C6OB	San Francisco	0	0	76	22	1	48	0	0	0	0	0	0	147
Darya Shanthi	VRXB2	Anchorage	4	0	1	0	0	0	0	0	48	69	0	0	122
Darya Shree	VRZZ2	Anchorage	0	0	0	0	0	0	0	3	5	0	0	0	8
Darya Tara	VRWS5	Anchorage	0	0	1	0	0	9	1	5	3	16	0	0	35
David Foss	WYQ8110	Kodiak	0	0	0	0	0	0	0	2	1	4	0	0	7
Deepwater Millennium	V7HD2	New Orleans	48	11	9	3	1	0	0	0	73	19	0	0	164
Defender	WBN3016	Jacksonville	0	0	0	0	0	0	7	6	0	3	0	0	16
Delaware II	KNBD	New York City	63	266	99	0	491	369	415	450	209	216	0	0	2578
Delaware II (Aws)	NWS0012	New York City	181	327	115	0	0	80	360	242	0	371	0	0	1676
Delaware Trader	WDB3258	Miami	0	1	6	1	51	0	0	0	0	0	0	0	59
Deliverance	WDE2652	Valdez	0	0	2	11	19	32	27	26	5	0	0	0	122
Diane H	WUR7250	Kodiak	0	0	0	0	1	6	9	8	2	7	0	0	33

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Discoverer Clear Leader	V7MO2	New Orleans	146	157	148	61	78	67	71	73	58	77	0	0	936
Discoverer Deep Seas	V7HC6	New Orleans	185	196	205	159	155	142	175	142	150	191	0	0	1700
Discoverer Enterprise	V7HD3	New Orleans	0	1	0	0	0	0	0	0	0	2	0	0	3
Discoverer Inspiration	V7MO3	New Orleans	0	76	43	30	10	21	18	3	2	0	0	0	203
Discoverer Spirit	V7HC8	New Orleans	12	14	3	0	0	23	3	0	0	0	0	0	55
Disney Magic	C6PT7	Jacksonville	199	133	136	193	181	109	100	65	284	110	0	0	1510
Disney Wonder	C6QM8	Jacksonville	24	17	29	18	3	2	0	72	24	34	0	0	223
Dominator	WBZ4106	Valdez	4	11	19	5	0	5	19	54	27	10	0	0	154
Donau	ONBL	Houston	0	16	31	3	0	0	0	0	0	0	0	0	50
Drew Foss	WYL5718	Kodiak	0	0	0	0	0	9	15	20	12	13	0	0	69
Duncan Island	C6JS	Miami	43	70	78	72	54	54	73	59	56	65	0	0	624
Dynamic Energy	C6FT3	Anchorage	0	0	0	22	0	5	3	0	0	0	0	0	30
Dynamic Vision	C6FQ6	Houston	116	75	42	3	22	20	27	16	8	0	0	0	329
Eagle	NRCB	Kodiak	0	0	2	0	0	0	0	0	0	0	0	0	2
Eagle Albany	S6TD	Houston	0	0	61	33	12	1	13	0	0	0	0	0	120
Eagle Anaheim	S6TF	New Orleans	70	53	67	58	68	66	66	44	48	56	0	0	596
Eagle Austin	S6TB	Houston	37	25	11	0	7	13	3	0	0	0	0	0	96
Eagle Baltimore	9VHG	New York City	2	1	0	0	0	0	0	0	0	0	0	0	3
Eagle Kuching	9V8132	Houston	0	1	36	39	46	144	177	87	101	81	0	0	712
Eagle Otome	S6FM	New Orleans	1	0	0	0	0	0	0	0	0	0	0	0	1
Eagle Phoenix	9VKH2	Houston	83	77	64	56	29	44	50	48	43	15	0	0	509
Eagle Stavanger	3FNZ5	Houston	0	0	33	11	16	66	119	173	135	79	0	0	632
Eagle Sydney	3FUU	Norfolk	0	0	0	0	0	0	0	0	2	0	0	0	2
Eagle Toledo	S6NK3	New Orleans	33	20	33	15	17	9	5	12	18	12	0	0	174
Eagle Torrance	9VMG5	Houston	0	0	0	0	0	0	13	13	0	0	0	0	26
Eagle Trenton	S6NK4	Houston	6	0	9	0	0	0	0	0	0	0	0	0	15
Eagle Tucson	S6NK5	Houston	2	0	0	0	0	59	36	27	0	0	0	0	124
Edgar B. Speer	WQZ9670	Duluth	17	0	6	62	101	187	221	28	64	196	0	0	882

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Edwin H. Gott	WXQ4511	Duluth	0	0	6	55	13	21	55	88	20	0	0	0	258
El Faro	WFJK	Jacksonville	0	0	0	0	0	0	18	66	53	52	0	0	189
El Yunque	WGJT	Jacksonville	25	19	45	44	42	47	56	64	22	0	0	0	364
Elversele	ONCT	Jacksonville	59	41	47	14	48	66	55	1	0	0	0	0	331
Empire State	KKFW	New York City	0	0	0	0	126	89	77	23	0	0	0	0	315
Enchantment Of The Seas	C6FZ7	Miami	47	60	40	36	34	39	47	19	5	12	0	0	339
Endeavor (Aws)	NWS0022	New York City	654	666	728	404	438	681	700	715	706	719	0	0	6411
Endurance	WDA3359	Valdez	48	77	1	0	13	36	50	11	3	17	0	0	256
Endurance	WDE9586	Houston	0	2	16	0	8	47	79	52	46	70	0	0	320
Ensign	WBN3012	Jacksonville	0	0	0	0	0	0	26	0	27	11	0	0	64
Eot Spar	WDE9193	Miami	50	31	14	32	25	38	38	25	14	24	0	0	291
Erkan K	V7ND9	Norfolk	35	28	9	21	12	0	0	0	0	0	0	0	105
Ernest N	A8PQ6	Anchorage	59	35	80	83	11	31	25	19	1	13	0	0	357
Eships Bainunah	ZDIQ7	Jacksonville	0	0	0	0	0	0	200	659	674	402	0	0	1935
Eships Nahyan	ZDIY2	Anchorage	0	12	37	40	36	23	25	48	38	16	0	0	275
Eurodam	PHOS	Miami	61	60	12	32	43	9	13	3	6	8	0	0	247
Eurus Lima	A8MH9	New Orleans	2	2	5	3	2	3	0	0	0	0	0	0	17
Eurus Lisbon	A8MI2	New Orleans	4	0	4	6	7	3	4	0	0	0	0	0	28
Eurus London	A8MH7	New Orleans	16	11	7	2	0	0	0	0	0	0	0	0	36
Ever Dainty	9V7951	Norfolk	1	0	1	3	6	14	24	7	15	16	0	0	87
Ever Decent	9V7952	New York City	25	1	0	0	0	0	1	0	0	0	0	0	27
Ever Delight	3FCB8	New York City	6	0	0	23	30	19	23	63	90	97	0	0	351
Ever Deluxe	9V7953	New York City	9	0	11	20	9	3	0	0	0	0	0	0	52
Ever Develop	3FLF8	New York City	7	0	0	18	3	16	13	16	6	5	0	0	84
Ever Devote	9V7954	New York City	14	2	4	13	10	11	0	0	0	0	0	0	54
Ever Diadem	9V7955	New York City	23	26	27	32	12	24	16	35	43	55	0	0	293
Ever Diamond	3FQS8	New York City	71	83	104	28	30	67	13	0	0	0	0	0	396
Ever Dynamic	3FUB8	New York City	11	13	17	8	18	0	0	0	0	0	0	0	67

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Ever Envoy	VSQL9	Seattle	0	0	0	0	2	4	0	0	0	0	0	0	6
Ever Ethic	VQFS4	Seattle	0	0	0	0	0	0	0	10	9	32	0	0	51
Ever Excel	VSXV3	Los Angeles	0	0	0	0	51	51	14	24	16	3	0	0	159
Ever Radiant	3FFR4	Los Angeles	0	0	6	8	9	10	14	9	9	2	0	0	67
Ever Reach	3FQO4	New York City	15	9	14	2	13	6	8	12	23	0	0	0	102
Ever Refine	3FSB4	New York City	2	14	11	0	7	37	60	75	32	45	0	0	283
Ever Repute	3FRZ4	New York City	0	0	0	8	10	7	0	0	0	0	0	0	25
Ever Respect	3FRZ4	New York City	0	0	0	8	10	7	0	0	0	0	0	0	25
Ever Result	3FSA4	New York City	4	1	0	0	0	15	10	12	10	9	0	0	61
Ever Reward	3FYB3	New York City	13	0	12	3	8	7	8	30	16	20	0	0	117
Ever Safety	3EMQ4	Anchorage	0	0	0	0	35	4	1	0	0	0	0	0	40
Ever Salute	3ENU5	Anchorage	0	0	5	6	0	0	0	0	0	18	0	0	29
Ever Steady	3EHT6	Anchorage	19	126	139	157	126	141	125	137	126	136	0	0	1232
Ever Summit	3EKU3	Anchorage	38	25	41	22	11	2	0	1	0	0	0	0	140
Ever Uberty	9V7960	Seattle	16	12	24	24	15	0	0	23	12	0	0	0	126
Ever Ultra	3FEJ6	Seattle	0	0	0	0	2	5	0	0	4	0	0	0	11
Ever Ulysses	9V7962	Anchorage	0	10	12	8	0	11	0	0	13	0	0	0	54
Ever Unific	9V7961	Anchorage	0	4	0	2	0	0	0	0	0	0	0	0	6
Ever Union	3FFG7	Seattle	0	0	0	0	0	0	0	0	0	2	0	0	2
Ever Unique	9V7959	Seattle	19	6	0	0	0	0	3	0	0	5	0	0	33
Ever United	9V7957	Seattle	0	0	0	0	0	0	0	26	5	2	0	0	33
Ever Unity	3FCD9	Seattle	0	0	0	0	0	0	4	5	2	0	0	0	11
Ever Uranus	3FCA9	Seattle	0	17	0	0	16	10	0	0	1	2	0	0	46
Ever Useful	3FCC9	Anchorage	0	0	0	0	0	13	2	0	0	7	0	0	22
Ever Utile	3FZA9	Seattle	0	0	0	0	0	4	0	0	0	0	0	0	4
Everest Spirit	C6FY8	Anchorage	47	34	14	39	40	42	107	180	59	51	0	0	613
Excalibur	ONCE	Houston	100	80	82	63	75	93	113	72	132	86	0	0	896
Excel	ONAI	Houston	0	0	13	2	1	0	0	35	74	59	0	0	184

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Excelerate	ONDY	Houston	0	0	0	0	0	0	0	0	13	0	0	0	13
Explorer	ONFE	Houston	0	0	28	0	0	0	0	0	0	0	0	0	28
Explorer	WBN7618	Jacksonville	0	0	0	0	0	4	2	4	0	1	0	0	11
Explorer Of The Seas	C6SE4	New York City	7	15	7	0	0	0	3	22	21	25	0	0	100
Fairchem Filly	3EJM9	Anchorage	0	0	12	0	56	18	0	0	34	15	0	0	135
Fairchem Stallion	H3WD	Anchorage	11	0	0	0	0	0	0	0	0	0	0	0	11
Fairchem Steed	3EBR5	Anchorage	0	11	1	0	0	11	0	1	0	0	0	0	24
Fairweather	WDB5604	Kodiak	3	0	0	0	0	1	0	0	0	0	0	0	4
Fairweather	WTEB	Anchorage	3	0	0	0	0	14	78	168	106	70	0	0	439
Fairweather (Aws)	NWS0004	Anchorage	0	0	0	323	516	523	559	727	612	548	0	0	3808
Federal Asahi	VRWG3	Anchorage	0	0	0	0	0	0	13	11	9	14	0	0	47
Federal Mackinac	V7RI8	Anchorage	11	22	4	67	53	78	27	60	49	16	0	0	387
Federal Progress	VRXL6	Anchorage	19	10	18	9	3	0	0	0	0	0	0	0	59
Federal Venture	VRXL7	Anchorage	0	15	62	56	51	36	15	21	0	1	0	0	257
Fish Hawk	WRB5085	Kodiak	0	0	0	0	0	0	1	0	3	3	0	0	7
Flanders Loyalty	ONEV	Houston	64	41	55	60	55	42	32	11	0	12	0	0	372
FMG Cloudbreak	ONFW	Anchorage	0	0	0	0	0	0	4	32	25	28	0	0	89
FMG Matilda	ONFN	Anchorage	0	0	0	0	0	0	0	15	26	17	0	0	58
Freedom	WDB5483	Jacksonville	7	0	0	0	0	0	18	9	17	8	0	0	59
Freedom Of The Seas	C6UZ7	Jacksonville	66	23	20	0	47	9	8	6	5	0	0	0	184
Freja Dania	A8LC2	Anchorage	0	0	0	0	14	0	19	3	0	0	0	0	36
Fritzi N	A8PQ4	Anchorage	99	197	376	194	422	482	423	428	390	174	0	0	3185
Front Kathrine	V7QX2	Anchorage	0	0	0	0	32	35	51	3	0	0	0	0	121
Front Tina	A8HH5	Anchorage	0	0	0	0	0	0	0	0	0	3	0	0	3
G. L. Ostrander	WCV7620	Duluth	0	0	7	2	3	44	21	21	17	39	0	0	154
Garden City River	S6AJ8	Anchorage	0	10	3	1	0	0	0	0	0	0	0	0	14
Gauntlet	WBN6511	Jacksonville	0	0	0	0	0	1	26	11	43	41	0	0	122
Gemini Voyager	C6FE5	Los Angeles	18	46	40	63	27	38	21	1	0	0	0	0	254

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Genco Acheron	VRCF7	Anchorage	0	0	0	0	0	0	25	50	40	7	0	0	122
Genco Augustus	VRDD2	Anchorage	0	0	0	0	0	0	0	14	61	32	0	0	107
Genco Claudius	V7SY6	Anchorage	0	0	0	0	0	0	0	17	23	19	0	0	59
Genco Constantine	VRDR8	Anchorage	0	0	0	0	0	71	16	40	47	60	0	0	234
Genco Tiberius	VRDD3	Anchorage	0	0	0	0	0	0	0	0	12	19	0	0	31
George N	A8PQ5	Anchorage	17	23	79	48	44	75	52	6	18	11	0	0	373
Gerd Maersk	OYGM2	Seattle	8	0	6	4	0	0	0	0	0	0	0	0	18
Geysir	WCZ5528	Norfolk	45	22	8	0	0	0	0	34	2	0	0	0	111
Gladiator	WBN5982	Kodiak	0	0	0	0	0	0	20	64	0	0	0	0	84
Glen Canyon Bridge	3EFD9	Seattle	0	0	0	0	0	0	0	16	32	0	0	0	48
Global Hime	9VCK3	Anchorage	2	50	55	3	0	0	0	0	0	0	0	0	110
Global Sentinel	V7KR4	Seattle	0	0	2	0	64	46	0	111	109	0	0	0	332
Golden Bear	NMRY	San Francisco	0	0	0	0	40	39	42	65	0	0	0	0	186
Golden State	WHDV	San Francisco	33	17	5	0	13	7	0	8	2	0	0	0	85
Gordon Gunter (Aws)	NWS0014	New Orleans	0	0	0	411	487	114	586	315	552	428	0	0	2893
Grandeur Of The Seas	C6SE3	Miami	11	8	9	17	300	83	29	21	26	6	0	0	510
Great Land	WFDP	Seattle	0	40	0	0	0	0	0	0	0	0	0	0	40
Green Bay	WDD9433	Charleston	0	0	0	17	25	0	0	0	13	42	0	0	97
Green Dale	WCZ5238	Jacksonville	30	0	0	8	32	37	42	48	30	41	0	0	268
Green Lake	WDDI	Baltimore	38	3	0	0	0	0	0	0	0	0	0	0	41
Green Ridge	WZZF	Jacksonville	32	36	39	22	26	2	45	31	41	61	0	0	335
Gretchen H	WDC9138	Kodiak	56	0	18	19	17	37	44	65	103	31	0	0	390
GSF Development Driller I	YJSW5	New Orleans	0	0	0	78	82	87	91	81	82	81	0	0	582
GSF Development Driller II	YJUL9	New Orleans	0	0	0	0	0	12	20	44	42	45	0	0	163
GSF Explorer	WDD7518	New Orleans	41	7	0	0	16	1	0	0	0	0	0	0	65
GSF Grand Banks	YJUF7	Houston	4	138	178	158	112	105	112	103	86	115	0	0	1111
Guard	WCY2823	Valdez	0	1	0	0	0	0	0	0	0	0	0	0	1
Guardian	WBO2511	Valdez	12	7	7	51	15	0	14	32	51	12	0	0	201

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Gudrun Maersk	OYAU2	Seattle	0	0	4	18	0	0	0	0	0	0	0	0	22
Gulf Reliance	WDD2703	Kodiak	15	15	0	5	33	75	13	70	49	22	0	0	297
Gulf Titan	WDA5598	Kodiak	3	5	18	10	2	6	2	16	5	14	0	0	81
H A Sklenar	C6CL6	New Orleans	12	27	16	17	83	107	150	133	106	89	0	0	740
H. Lee White	WZD2465	Duluth	0	0	0	26	21	12	56	32	44	24	0	0	215
Half Moon	WDE8672	New York City	0	0	0	0	0	0	1	0	50	0	0	0	51
Halle Foss	WCF3930	Kodiak	0	0	0	0	0	0	1	0	0	0	0	0	1
Harmonious	VRCL9	Anchorage	0	13	8	23	20	21	30	17	7	1	0	0	140
Harriette	WRFJ	Houston	44	76	20	22	20	5	0	2	7	0	0	0	196
Hatsu Eagle	ZNZH6	Seattle	18	0	0	0	11	10	12	17	8	24	0	0	100
Hatsu Smart	MLBD9	Seattle	0	13	6	0	0	0	0	0	0	0	0	0	19
Healy	NEPP	Seattle	0	0	0	0	23	127	97	162	79	9	0	0	497
Healy (Aws)	NWS0003	Seattle	0	0	0	0	173	522	586	377	709	280	0	0	2647
Helenka B	WAH5520	Anchorage	0	0	1	0	0	1	1	3	3	4	0	0	13
Henry B. Bigelow (Aws)	NWS0017	New York City	0	76	474	509	67	0	271	471	261	0	0	0	2129
Henry Goodrich	HP6038	Houston	122	99	85	72	0	0	0	85	71	106	0	0	640
Herbert C. Jackson	WL3972	Duluth	2	0	22	63	118	34	88	84	96	89	0	0	596
High Glory	3EFV2	Anchorage	1	4	1	1	2	0	0	0	0	0	0	0	9
Hi'ialakai	WTEY	Honolulu	15	17	31	80	69	39	18	48	85	29	0	0	431
Hi'ialakai (Aws)	NWS0010	Honolulu	234	651	628	514	339	473	216	394	0	508	0	0	3957
Hoegh Oslo	LAEK7	Jacksonville	100	62	97	58	50	58	48	84	63	49	0	0	669
Hollyhock	NHHF	Duluth	2	1	0	4	4	2	2	0	0	0	0	0	15
Honor	WDC6923	Baltimore	52	73	76	14	34	37	34	61	52	42	0	0	475
Hood Island	C6LU4	Miami	59	49	63	72	58	64	70	75	64	57	0	0	631
Horizon Anchorage	KGTX	Anchorage	151	0	141	98	132	106	84	98	177	140	0	0	1127
Horizon Challenger	WZJC	Houston	42	63	84	70	60	86	94	184	163	65	0	0	911
Horizon Consumer	WCHF	Los Angeles	12	10	28	16	5	72	65	62	66	25	0	0	361
Horizon Discovery	WZJD	Houston	76	82	42	0	0	0	0	0	0	0	0	0	200

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Horizon Eagle	WDD6039	San Francisco	64	67	69	64	80	77	98	63	71	84	0	0	737
Horizon Enterprise	KRGB	San Francisco	48	36	56	46	60	44	32	55	7	72	0	0	456
Horizon Falcon	WDD6040	San Francisco	63	84	53	47	68	90	91	64	50	75	0	0	685
Horizon Hawk	WDD6033	San Francisco	30	59	62	40	56	41	52	60	32	39	0	0	471
Horizon Hunter	WDD6038	San Francisco	56	55	65	68	59	43	64	53	54	53	0	0	570
Horizon Kodiak	KGTZ	Anchorage	49	80	62	55	63	59	36	50	69	66	0	0	589
Horizon Navigator	WPGK	Jacksonville	0	1	68	78	75	76	78	78	60	50	0	0	564
Horizon Pacific	WSRL	San Francisco	81	64	51	64	52	58	51	53	61	72	0	0	607
Horizon Producer	WJBJ	Jacksonville	172	138	89	144	132	105	182	155	92	106	0	0	1315
Horizon Reliance	WFLH	Los Angeles	80	66	64	75	68	25	23	84	55	85	0	0	625
Horizon Spirit	WFLG	Los Angeles	77	79	85	32	21	89	80	91	71	68	0	0	693
Horizon Tacoma	KGTY	Anchorage	44	55	44	41	59	49	61	23	8	17	0	0	401
Horizon Tiger	WDD6042	San Francisco	47	50	50	50	31	30	36	65	24	45	0	0	428
Horizon Trader	KIRH	New York City	88	70	75	72	83	77	87	85	161	69	0	0	867
Hos Achiever	YJVG4	New Orleans	16	25	0	7	0	0	0	0	0	0	0	0	48
Houston	KCDK	Houston	16	9	5	0	0	0	54	17	12	0	0	0	113
HS Livingstone	9HYN7	New York City	0	0	0	0	6	0	0	0	0	0	0	0	6
Indedpendence II	WGAX	Baltimore	61	63	79	97	93	69	83	91	104	82	0	0	822
Independence Of The Seas	C6WW4	Miami	21	113	117	40	2	32	61	48	26	30	0	0	490
Indian Ocean	C6T2063	New York City	48	38	29	27	27	31	27	21	56	22	0	0	326
Indiana Harbor	WXN3191	Duluth	47	0	10	77	109	106	101	90	60	76	0	0	676
Inland Seas	WCJ6214	Duluth	0	0	0	0	4	8	2	3	1	0	0	0	18
Integrity	WDC6925	Baltimore	69	44	61	58	74	66	65	43	28	75	0	0	583
Integrity	WDD7905	Kodiak	0	0	0	0	0	1	0	0	0	0	0	0	1
Invader	WBO3337	Valdez	8	17	0	0	0	18	37	37	6	0	0	0	123
Irenes Remedy	SYAQ	New York City	1	4	10	9	12	2	0	0	0	0	0	0	38
Island Champion	WCZ7046	Kodiak	0	2	0	0	0	0	0	0	0	0	0	0	2
Island Scout	WDC6588	Kodiak	0	0	0	0	0	0	0	0	7	5	0	0	12

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Island Spirit	WDB6620	Kodiak	0	0	0	0	0	5	6	11	13	20	0	0	55
Island Warrior	WDA9217	Kodiak	0	0	0	0	0	0	0	1	0	0	0	0	1
Iver Foss	WYE6442	Kodiak	0	3	0	7	4	15	0	0	0	0	0	0	29
James R. Barker	WYP8657	Duluth	15	0	18	27	53	52	93	85	63	86	0	0	492
Jarvis	NAQD	Kodiak	0	0	22	1	0	0	0	0	0	0	0	0	23
Jean Anne	WDC3786	Los Angeles	68	62	100	88	70	48	102	110	92	64	0	0	804
Jeffrey Foss	WY9383	Kodiak	13	18	6	1	2	0	0	0	0	0	0	0	30
Jenny N	A8PQ7	Anchorage	97	96	100	159	236	260	259	114	24	0	0	0	1345
Jeppesen Maersk	OWTW2	New York City	33	12	35	12	0	42	9	59	8	49	0	0	259
John B. Aird	VCYP	Duluth	0	0	0	2	0	11	5	6	4	22	0	0	50
John D. Leitch	VGWM	Duluth	0	0	3	0	0	120	91	47	24	0	0	0	285
John G. Munson	WE3806	Duluth	0	0	10	35	49	17	7	4	88	56	0	0	266
John J. Boland	WZE4539	Duluth	21	0	0	0	0	0	11	5	14	46	0	0	97
Joides Resolution	D5BC	Norfolk	12	6	0	0	0	0	0	0	2	3	0	0	23
Joseph L. Block	WDA2768	Duluth	0	0	77	98	56	108	254	204	142	179	0	0	1118
Ka'imimoana	WTEU	Honolulu	63	75	61	92	1	0	96	69	94	88	0	0	639
Ka'imimoana (Aws)	NWS0009	Honolulu	531	533	443	708	20	31	525	507	689	624	0	0	4611
Kaiti Hill	VRZN4	Anchorage	4	32	6	0	0	0	0	0	0	0	0	0	42
Kaministiqua	CFN4612	Duluth	0	0	0	0	0	0	3	4	2	1	0	0	10
Karen Andrie	WBS5272	Duluth	37	0	7	23	0	27	37	128	256	293	0	0	808
Karoline N	A8PQ8	Anchorage	6	4	29	17	10	18	40	94	23	0	0	0	241
Kasif Kalkavan	V7IX7	Norfolk	0	48	42	46	45	23	28	54	47	38	0	0	371
Kauai	WSRH	San Francisco	0	0	0	0	0	0	0	10	22	20	0	0	52
Kaye E. Barker	WCF3012	Duluth	0	0	0	0	0	2	52	44	34	38	0	0	170
Kennicott	WCY2920	Kodiak	0	0	0	0	6	33	33	16	9	11	0	0	108
Keswick	C6XE5	Anchorage	8	4	10	10	10	7	12	15	15	18	0	0	109
Kilo Moana	WDA7827	Honolulu	3	53	58	63	22	30	47	45	23	52	0	0	396
Kings Pointer	WTDL	New York City	0	100	19	0	0	0	0	0	0	0	0	0	119

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Kiyi	KAO107	Duluth	0	0	0	0	20	20	10	6	17	7	0	0	80
Knorr (Aws)	NWS0029	New York City	492	667	723	674	712	667	728	533	638	710	0	0	6544
Kodiak	KQXZ	Valdez	18	11	5	1	2	9	3	0	2	7	0	0	58
Kota Halus	9V8258	Anchorage	14	20	23	22	27	16	34	11	19	11	0	0	197
Kota Jaya	VRWM2	Anchorage	16	14	7	0	0	0	0	0	4	11	0	0	52
Laurence M. Gould (Aws)	WCX7445	New Orleans	301	565	382	609	637	693	224	0	419	434	0	0	4264
Lavender Passage	3FJY6	Anchorage	4	0	10	9	0	7	15	4	6	7	0	0	62
Lee A. Tregurtha	WUR8857	Duluth	21	0	2	25	39	2	14	10	23	46	0	0	182
Leo Forest	3FPH8	Seattle	22	12	19	19	7	0	12	7	11	16	0	0	125
Leslie Lee	WYC7933	Valdez	0	0	1	0	0	0	0	0	0	0	0	0	1
Leyte Spirit	C6LC6	Anchorage	35	0	0	0	46	34	0	0	0	0	0	0	115
Liberty	WRYX	Jacksonville	96	85	15	44	48	59	5	48	34	27	0	0	461
Liberty Eagle	WHIA	Houston	11	2	1	0	28	3	47	15	0	0	0	0	107
Liberty Glory	WADP	Houston	61	34	52	46	38	31	9	30	0	9	0	0	310
Liberty Grace	WADN	Houston	10	30	45	0	35	55	51	27	22	46	0	0	321
Liberty Of The Seas	C6VQ8	Miami	60	36	20	5	21	34	33	27	35	41	0	0	312
Liberty Spirit	WCPU	Houston	8	32	14	44	44	31	38	14	30	1	0	0	256
Liberty Star	WCBP	Houston	62	20	13	68	77	58	51	44	94	57	0	0	544
Liberty Sun	WCOB	Houston	23	4	31	39	16	25	12	27	15	95	0	0	287
Limerick Spirit	C6VF3	Anchorage	60	30	1	44	57	52	33	27	1	1	0	0	306
Lion City River	9VJC5	Anchorage	0	26	22	1	0	0	0	0	0	0	0	0	49
Livorno Express	ZCDV9	Houston	0	0	34	0	0	14	18	6	0	0	0	0	72
LNG Abuja	C6W2032	Anchorage	0	0	2	0	0	3	7	9	16	1	0	0	38
LNG Aquarius	V7BW6	Anchorage	57	94	60	79	94	67	39	10	0	0	0	0	500
LNG Aries	V7BW7	New York City	41	109	141	133	118	127	168	146	110	107	0	0	1200
LNG Capricorn	V7BW8	New York City	84	78	39	2	22	25	75	135	114	57	0	0	631
LNG Edo	C6W2033	Anchorage	19	36	12	32	69	10	10	36	34	15	0	0	273
LNG Gemini	V7BW9	Anchorage	53	85	58	82	94	80	75	67	53	51	0	0	698

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LNG Leo	V7BX2	New York City	32	34	70	78	44	65	56	56	42	52	0	0	529
LNG Libra	V7BX3	Anchorage	92	83	72	100	73	34	71	35	105	71	0	0	736
LNG Taurus	V7BX4	New York City	55	54	63	71	108	143	148	124	48	15	0	0	829
LNG Virgo	V7BX5	New York City	72	84	114	107	91	89	86	89	51	47	0	0	830
Lois H	WTD4576	Kodiak	0	0	0	0	0	0	4	3	8	3	0	0	18
Lowlands Ghent	9HA2113	Anchorage	5	5	17	4	0	1	0	0	0	0	0	0	32
Lowlands Orchid	ONFP	Anchorage	0	0	0	0	9	110	69	18	13	68	0	0	287
Maasdam	PFRO	Miami	9	3	68	56	45	10	0	193	202	95	0	0	681
Mackinaw	NBGB	Duluth	4	3	4	2	1	0	0	0	0	0	0	0	14
Madrid Spirit	ECFM	Anchorage	64	64	73	82	97	67	68	70	70	68	0	0	723
Maersk Carolina	WBDS	Charleston	31	22	30	42	103	65	17	36	17	54	0	0	417
Maersk Constellation	WRYJ	Houston	7	2	1	10	2	0	11	17	9	50	0	0	109
Maersk Georgia	WAHP	New York City	16	42	22	20	43	11	38	21	13	30	0	0	256
Maersk Idaho	WKPM	New York City	1	22	4	37	14	10	27	43	62	11	0	0	231
Maersk Iowa	KABL	Norfolk	43	44	63	28	55	60	71	79	51	62	0	0	556
Maersk Jaun	HBDD	Charleston	24	29	44	51	50	0	18	45	48	55	0	0	364
Maersk Karlskrona	A8PW8	New York City	28	11	11	14	22	20	29	32	15	6	0	0	188
Maersk Kentucky	WKPY	Houston	55	28	13	35	36	49	68	30	12	14	0	0	340
Maersk Merritt	VRCH6	Los Angeles	0	0	0	0	0	0	0	24	0	9	0	0	33
Maersk Messologi	3EIM6	San Francisco	0	0	0	0	1	0	0	0	0	0	0	0	1
Maersk Missouri	WAHV	Norfolk	70	61	59	72	78	68	59	44	45	29	0	0	585
Maersk Montana	WCDP	New York City	67	67	92	64	20	18	3	24	40	49	0	0	444
Maersk Mykonos	SXSQ	New York City	12	12	12	9	13	15	17	13	0	13	0	0	116
Maersk Ohio	KABP	New York City	76	54	74	81	68	86	67	79	85	68	0	0	738
Maersk Privilege	9VVD6	Anchorage	96	12	2	0	0	0	0	0	0	0	0	0	110
Maersk Tangier	A8NH3	Miami	1	0	0	1	0	7	18	15	5	10	0	0	57
Maersk Tarragona	A8NH4	New York City	0	0	0	6	0	0	11	9	10	10	0	0	46
Maersk Tennessee	WMFW	Norfolk	0	0	0	0	0	0	0	0	53	59	0	0	112

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Maersk Texas	KRPW	Norfolk	0	17	0	0	0	0	0	0	0	0	0	0	17
Maersk Utah	WKAB	Norfolk	84	102	75	71	87	109	99	90	104	85	0	0	906
Maersk Virginia	WAHK	Norfolk	12	29	71	12	49	5	64	81	91	92	0	0	506
Maersk Wisconsin	WKPN	Houston	13	1	23	21	32	12	33	99	71	43	0	0	348
Maersk Wyoming	WKPF	Houston	50	33	36	77	71	85	75	88	75	79	0	0	669
Mahimahi	WHRN	Los Angeles	23	12	41	35	21	44	45	42	39	16	0	0	318
Maia H	WYX2079	Kodiak	0	0	1	27	19	21	32	3	50	10	0	0	163
Majestic Maersk	OUJH2	New York City	0	0	0	40	27	27	36	13	0	0	0	0	143
Majesty Of The Seas	C6FZ8	Miami	23	6	0	0	13	21	17	22	17	0	0	0	119
Malolo	WYH6327	Kodiak	0	0	0	0	0	0	0	0	0	50	0	0	50
Manistee	WDB6831	Duluth	0	0	0	0	0	1	3	5	57	43	0	0	109
Manitowoc	WDE3569	Duluth	0	0	0	38	53	40	82	35	170	341	0	0	759
Manoa	KDBG	San Francisco	36	37	27	32	28	32	27	30	32	63	0	0	344
Manukai	WRGD	Los Angeles	21	3	1	0	4	9	0	0	0	3	0	0	41
Manulani	WECH	Los Angeles	26	33	0	46	56	55	24	18	21	43	0	0	322
Marchen Maersk	OUIY2	Seattle	66	0	0	52	11	0	40	24	0	36	0	0	229
Marcus G. Langseth	WDC6698	Anchorage	0	0	0	0	15	0	31	87	47	0	0	0	180
Maren Maersk	OUJI2	Seattle	72	3	0	33	21	0	14	28	0	0	0	0	171
Margrethe Maersk	OZBY2	Seattle	0	24	6	0	56	28	0	36	42	0	0	0	192
Maria A. Angelicoussis	C6FP2	Los Angeles	93	42	55	76	57	0	0	0	0	0	0	0	323
Marie Maersk	OULL2	New York City	30	56	13	30	8	22	0	0	0	25	0	0	184
Marilyn	WFQB	Houston	53	36	149	193	40	47	42	46	68	25	0	0	699
Mariner Of The Seas	C6FV9	Jacksonville	8	14	27	28	28	24	21	37	35	20	0	0	242
Marit Maersk	OUJN2	Los Angeles	0	0	39	24	0	17	46	0	17	8	0	0	151
Mary Ann Hudson	KSDF	Houston	39	60	79	0	0	0	0	55	18	46	0	0	297
Matanuska	WN4201	Kodiak	2	42	27	1	9	9	0	0	0	0	0	0	90
Maui	WSLH	San Francisco	61	63	40	0	0	0	0	0	0	0	0	0	164
Maumee	WDA4649	Duluth	0	0	0	40	33	104	245	141	181	214	0	0	958

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Maunalei	KFMV	Baltimore	0	20	0	0	24	15	2	8	10	18	0	0	97
Maunawili	WGEB	Los Angeles	58	63	35	35	24	49	41	35	22	53	0	0	415
Mcarthur II	WTEJ	Seattle	0	0	0	0	0	0	30	153	184	187	0	0	554
Mcarthur II (Aws)	NWS0006	Seattle	0	0	0	123	725	150	489	618	674	668	0	0	3447
Mckee Sons	WCZ9703	Duluth	0	0	0	0	11	0	0	0	0	0	0	0	11
Medeia	WDE6486	Anchorage	2	5	0	0	0	0	0	0	0	0	0	0	7
Mein Schiff	9HJH9	Miami	27	14	3	13	0	0	0	0	0	0	0	0	57
Melville	WECB	Los Angeles	83	46	58	40	85	66	88	71	62	89	0	0	688
Mesabi Miner	WYQ4356	Duluth	19	0	0	18	15	13	40	58	27	45	0	0	235
Meta	A8CG9	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Midnight Sun	WAHG	Seattle	82	75	59	91	114	46	92	91	127	69	0	0	846
Mike O'leary	WDC3665	Kodiak	0	0	0	0	2	1	0	0	1	0	0	0	4
Mill House	9VAK9	Anchorage	13	8	0	2	0	0	0	0	0	0	0	0	23
Mill Reef	9VAK8	Anchorage	16	1	1	0	0	0	0	0	77	48	0	0	143
Miller Freeman	WTDM	Seattle	0	0	101	328	298	245	260	155	510	291	0	0	2188
Miller Freeman (Aws)	NWS0005	Seattle	0	0	113	496	455	337	339	215	154	0	0	0	2109
Mindanao	S6SR	Anchorage	0	0	0	0	0	10	73	73	44	19	0	0	219
Mineral Beijing	ONAR	Anchorage	21	19	8	30	31	19	39	9	0	0	0	0	176
Mineral Belgium	ONCF	Anchorage	23	33	31	30	51	74	42	41	37	12	0	0	374
Mineral Dalian	ONFW	Anchorage	0	0	0	0	0	0	4	32	25	28	0	0	89
Mineral Noble	ONAN	Anchorage	44	34	40	35	35	54	8	98	138	224	0	0	710
Mineral Tianjin	ONBF	Anchorage	18	27	35	17	0	0	1	31	17	27	0	0	173
Miss Roxanne	WCX4992	Valdez	0	0	0	10	10	8	0	2	1	0	0	0	31
Mississippi Voyager	WDD7294	San Francisco	24	0	28	47	12	2	17	9	25	66	0	0	230
Mokihana	WNRD	San Francisco	42	30	38	42	41	39	27	17	2	7	0	0	285
Moku Pahu	WBWK	San Francisco	0	7	0	0	6	14	1	0	0	0	0	0	28
Monarch Of The Seas	C6FZ9	Jacksonville	15	9	0	12	5	0	1	8	2	20	0	0	72
Monitor	WCX9104	Jacksonville	0	0	0	0	0	0	0	1	0	0	0	0	1

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Montrealais	VDWC	Duluth	0	0	0	0	5	8	0	1	0	0	0	0	14
Murat K	V7NE2	Norfolk	0	0	0	2	3	1	1	0	1	0	0	0	8
Nachik	WDE7904	Kodiak	0	0	0	0	0	3	3	2	0	0	0	0	8
Nancy Foster	WTER	Charleston	0	16	17	29	27	4	26	180	427	390	0	0	1116
Nancy Foster (Aws)	NWS0008	Charleston	0	269	738	262	305	99	711	473	458	236	0	0	3551
Nathaniel B. Palmer (Aws)	WBP3210	Seattle	654	637	686	712	658	610	0	0	0	437	0	0	4394
National Glory	WDD4207	Houston	6	8	0	31	23	17	11	10	0	3	0	0	109
Navigator Of The Seas	C6FU4	Miami	10	36	78	30	12	8	4	0	14	17	0	0	209
Neptune Voyager	C6FU7	New Orleans	33	56	50	37	45	35	40	9	3	35	0	0	343
New Horizon	WKWB	Los Angeles	0	0	0	0	0	0	43	14	45	12	0	0	114
Nieuw Amsterdam	PBWQ	Anchorage	0	0	0	0	0	0	0	25	11	56	0	0	92
Noble Star	KRPP	Houston	107	65	89	21	67	5	30	35	76	44	0	0	539
Noordam	PHET	Anchorage	68	58	59	177	132	24	59	106	126	253	0	0	1062
Norman O	WDC5066	Kodiak	0	0	0	0	0	0	11	4	0	0	0	0	15
North Star	KIYI	Seattle	38	50	49	15	5	23	34	20	12	41	0	0	287
Northern Victor	WCZ6534	Kodiak	0	2	0	0	0	0	0	0	0	0	0	0	2
Northwest Swan	ZCDJ9	Anchorage	31	29	58	31	10	35	51	30	34	22	0	0	331
Norwegian Dawn	C6FT7	Anchorage	99	95	77	64	112	107	110	104	85	31	0	0	884
Norwegian Epic	C6XP7	Miami	0	0	0	0	0	2	5	15	26	0	0	0	48
Norwegian Gem	C6VG8	Jacksonville	27	7	8	103	88	61	44	58	104	125	0	0	625
Norwegian Jade	C6WK7	Anchorage	24	19	0	78	99	105	123	113	44	102	0	0	707
Norwegian Jewel	C6TX6	Jacksonville	17	0	0	14	34	7	0	8	64	12	0	0	156
Norwegian Pearl	C6VG7	Anchorage	15	3	0	52	26	27	12	5	3	23	0	0	166
Norwegian Sky	C6PZ8	Miami	33	16	5	6	3	18	22	18	10	0	0	0	131
Norwegian Spirit	C6TQ6	New Orleans	86	77	68	38	64	95	0	120	89	125	0	0	762
Norwegian Star	C6FR3	Anchorage	29	13	35	51	120	179	193	96	27	103	0	0	846
Norwegian Sun	C6RN3	Anchorage	161	204	237	214	66	55	31	31	96	73	0	0	1168
Nunaniq	WRC2049	Kodiak	0	0	0	0	0	0	0	0	0	2	0	0	2

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NYK Delphinus	3ENU7	Norfolk	0	17	47	36	28	4	1	0	0	0	0	0	133
NYK Demeter	3ENV5	New York City	11	10	9	15	8	9	6	0	0	0	0	0	68
Oasis Of The Seas	C6XS7	Miami	11	29	6	9	5	22	38	5	1	6	0	0	132
Ocean Atlas	WDHL	Norfolk	3	2	19	26	4	22	22	1	0	0	0	0	99
Ocean Charger	WDE9698	Houston	39	65	48	11	40	3	10	1	69	66	0	0	352
Ocean Crescent	WDF4929	Houston	0	0	0	0	0	0	0	4	4	31	0	0	39
Ocean Harvester	WBO5471	Kodiak	1	0	3	23	0	6	4	2	0	5	0	0	44
Ocean Mariner	WCF3990	Kodiak	0	0	0	0	3	18	0	8	10	76	0	0	115
Ocean President	VRAD4	Anchorage	1	18	6	1	4	0	0	0	7	0	0	0	37
Ocean Ranger	WAM7635	Kodiak	0	13	17	0	59	0	0	1	6	65	0	0	161
Ocean Titan	WDB9647	Kodiak	0	1	0	0	0	0	0	0	0	0	0	0	1
Ocean Titan	WDC7175	Houston	46	4	16	24	20	8	1	0	1	0	0	0	120
Ocean Watch (Aws)	NWS0023	Anchorage	16	9	18	23	11	0	0	0	0	0	0	0	77
Oceanus (Aws)	NWS0028	New York City	0	0	50	710	726	551	704	713	695	672	0	0	4821
Okeanos Explorer	WTDH	Honolulu	0	0	0	0	27	56	45	42	14	31	0	0	215
Okeanos Explorer (Aws)	NWS0016	Honolulu	0	0	299	4	490	106	402	361	130	238	0	0	2030
Oleander	V7SX3	New York City	13	17	17	31	17	27	44	58	62	40	0	0	326
OOCL America	VRWE8	Seattle	0	1	6	6	18	17	6	4	1	0	0	0	59
OOCL Busan	VRDN3	Charleston	6	3	0	0	16	31	36	43	58	78	0	0	271
OOCL Nagoya	VRFX8	New York City	0	0	6	16	25	33	36	36	36	12	0	0	200
OOCL Norfolk	VREX4	Norfolk	2	20	17	23	21	9	24	11	14	12	0	0	153
OOCL Seattle	3EIZ7	Seattle	3	3	0	0	0	0	0	0	0	0	0	0	6
Oosterdam	PBKH	Anchorage	72	0	70	65	45	31	2	24	79	66	0	0	454
Optimana	9VAR2	Anchorage	0	0	0	0	0	0	0	0	0	20	0	0	20
Orange Sky	ELZU2	New York City	16	21	8	6	0	21	13	0	0	0	0	0	85
Orange Star	ELFS7	New York City	0	16	26	7	9	14	3	0	0	0	0	0	75
Orange Sun	A8HY8	New York City	17	23	63	46	63	45	46	57	36	53	0	0	449
Orange Wave	ELPX7	New York City	60	40	1	0	0	0	30	22	32	30	0	0	215

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Ore Guaiba	A8TF2	Jacksonville	4	0	8	0	0	0	0	0	0	0	0	0	12
Oregon II (Aws)	NWS0013	New Orleans	0	0	0	0	0	146	496	427	570	470	0	0	2109
Oregon Voyager	WDF2960	San Francisco	0	0	0	0	20	31	22	9	1	19	0	0	102
Oriental Queen	VRAC9	Anchorage	7	2	59	44	47	40	29	18	12	184	0	0	442
Orion Voyager	C6MC5	Baltimore	0	0	0	0	0	0	0	0	26	21	0	0	47
Oscar Dyson	WTEP	Kodiak	21	129	251	89	322	314	433	360	421	104	0	0	2444
Oscar Dyson (Aws)	NWS0001	Kodiak	0	246	534	162	627	610	704	716	706	293	0	0	4598
Oscar Elton Sette	WTEE	Honolulu	70	71	119	166	122	13	24	90	176	123	0	0	974
Oscar Elton Sette (Aws)	NWS0015	Honolulu	147	241	583	536	464	64	231	287	638	112	0	0	3303
Ouro Do Brasil	ELPP9	Miami	28	6	2	0	0	4	15	10	9	13	0	0	87
Overseas Alcesmar	V7HP2	Anchorage	0	0	0	0	0	0	0	0	0	53	0	0	53
Overseas Alcmar	V7HP3	Anchorage	26	8	17	3	0	9	19	23	0	3	0	0	108
Overseas Anacortes	KCHV	New York City	0	0	0	0	0	0	0	0	48	25	0	0	73
Overseas Ariadmar	V7HP6	Anchorage	11	11	13	11	15	5	12	10	15	14	0	0	117
Overseas Boston	WJBU	Valdez	48	90	110	70	95	79	132	119	100	35	0	0	878
Overseas Cascade	WOAG	Charleston	0	0	27	6	11	15	4	0	0	0	0	0	63
Overseas Houston	WWAA	Miami	1	18	20	39	133	64	85	37	9	5	0	0	411
Overseas Joyce	V7NV4	Jacksonville	69	67	80	86	99	92	94	93	98	28	0	0	806
Overseas Long Beach	WAAT	Anchorage	137	217	244	61	0	57	90	72	91	44	0	0	1013
Overseas Los Angeles	WABS	Los Angeles	131	320	188	398	116	152	180	270	280	103	0	0	2138
Overseas Luxmar	WDC7070	Miami	18	2	17	10	15	2	12	15	2	22	0	0	115
Overseas Maremar	WDC6975	Houston	21	13	26	21	17	21	37	26	17	5	0	0	204
Overseas Martinez	WPAJ	Valdez	0	0	0	0	4	5	19	0	37	27	0	0	92
Overseas Nikiski	WDBH	Valdez	7	8	21	6	6	30	52	9	27	44	0	0	210
Overseas Philadelphia	WGDB	Miami	3	0	0	27	17	5	0	0	0	0	0	0	52
Overseas Texas City	WHED	Miami	8	23	30	19	96	60	43	13	9	2	0	0	303
Pacific Celebes	VRZN9	Los Angeles	21	62	15	60	52	14	45	33	9	29	0	0	340
Pacific Challenger	WDD9281	Kodiak	49	215	100	8	43	78	0	0	0	0	0	0	493

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Pacific Eagle	WDD9282	Kodiak	0	0	0	0	0	0	0	0	0	1	0	0	1
Pacific Flores	VRZN8	Los Angeles	40	23	34	8	40	8	20	32	28	5	0	0	238
Pacific Java	VRZN7	Los Angeles	0	0	0	0	0	0	0	0	1	38	0	0	39
Pacific Makassar	VRZO2	Los Angeles	62	8	42	52	25	37	48	2	0	18	0	0	294
Pacific Raven	WDD9278	Kodiak	0	0	0	0	0	0	0	0	0	4	0	0	4
Pacific Reliance	WDC9368	Kodiak	37	16	5	5	13	24	3	0	3	0	0	0	106
Pacific Star	WCW7740	Valdez	0	0	0	0	0	0	0	1	0	1	0	0	2
Pandalus	WAV7611	Anchorage	0	0	0	0	0	1	0	0	0	0	0	0	1
Patriarch	WBN3014	Jacksonville	0	0	0	0	0	0	26	0	51	4	0	0	81
Patriot	WQVY	Baltimore	37	44	21	0	15	30	27	35	11	25	0	0	245
Paul Gauguin	C6TH9	Anchorage	14	14	23	21	12	6	6	42	26	55	0	0	219
Paul R. Tregurtha	WYR4481	Duluth	0	0	0	50	38	45	65	101	93	34	0	0	426
Pelican State	WDE4433	Miami	34	30	1	15	44	15	25	42	7	13	0	0	226
Perseverance	WDE5328	Anchorage	0	0	0	6	15	11	0	9	8	0	0	0	49
Philadelphia Express	WDC6736	Houston	77	107	125	97	87	125	121	79	125	140	0	0	1083
Philip R. Clarke	WE3592	Duluth	0	0	0	0	26	22	26	13	13	13	0	0	113
Phoenix Alpha	VRZT8	Anchorage	24	31	25	76	39	1	16	26	22	18	0	0	278
Phoenix Light	HPHV	Anchorage	23	15	13	0	9	3	0	6	0	0	0	0	69
Phoenix Voyager	C6QE3	San Francisco	77	46	0	0	0	58	9	56	60	20	0	0	326
Pilot	WBN3011	Jacksonville	0	0	0	0	0	3	15	16	8	9	0	0	51
Pisces (Aws)	NWS0024	New Orleans	101	189	397	189	0	236	134	168	222	436	0	0	2072
Polar Adventure	WAZV	Valdez	0	31	21	31	26	31	25	111	34	1	0	0	311
Polar Discovery	WACW	Valdez	14	50	41	128	111	53	117	57	17	16	0	0	604
Polar Endeavour	WCAJ	Valdez	63	13	28	49	33	55	0	7	26	27	0	0	301
Polar Enterprise	WRTF	Valdez	48	15	68	59	17	16	57	3	41	53	0	0	377
Polar Ranger	WDC8652	Kodiak	0	0	0	0	0	0	0	5	11	10	0	0	26
Polar Resolution	WDJK	Valdez	181	102	123	154	211	0	0	0	10	94	0	0	875
Polar Sea (Aws)	NWS0027	Seattle	0	39	549	254	0	0	0	0	0	0	0	0	842

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Polar Spirit	C6WL6	Anchorage	47	36	41	25	6	0	13	25	34	27	0	0	254
Polar Storm	WDE8347	Kodiak	0	0	16	4	8	0	0	0	0	0	0	0	28
Polar Viking	WDD6494	Kodiak	0	0	0	0	4	17	0	0	0	0	0	0	21
Poul Spirit	C6FJ8	Anchorage	0	0	0	0	0	0	10	7	9	4	0	0	30
Premium Do Brasil	A8BL4	Miami	47	18	21	1	1	0	8	13	17	13	0	0	139
President Adams	WRYW	Norfolk	70	27	3	16	21	37	48	52	64	73	0	0	411
President Jackson	WRYC	Charleston	29	14	66	58	40	51	71	64	58	27	0	0	478
President Polk	WRYD	New York City	62	49	41	63	71	70	45	40	24	47	0	0	512
President Truman	WNDP	Charleston	47	32	38	3	35	51	41	5	9	11	0	0	272
Presque Isle	WZE4928	Duluth	23	0	15	70	73	51	21	66	57	116	0	0	492
Prestige New York	KDUE	Jacksonville	23	0	48	15	14	18	4	25	15	38	0	0	200
Pride Of America	WNBE	Anchorage	27	17	0	0	1	3	32	2	0	0	0	0	82
Pride Of Baltimore Ii	WUW2120	Baltimore	0	4	18	25	24	47	37	25	31	15	0	0	226
Prinsendam	PBGH	Anchorage	10	65	46	36	11	19	19	16	5	6	0	0	233
Pt. Barrow	WBM5088	Kodiak	0	0	0	0	0	0	0	0	2	0	0	0	2
Pt. Oliktok	WBM5091	Kodiak	0	0	0	0	0	0	0	9	1	0	0	0	10
Quebecois	CYGR	Duluth	0	0	0	0	0	0	0	6	16	5	0	0	27
R. M. Thorstenson	KGCJ	Kodiak	3	1	0	2	3	1	2	0	0	0	0	0	12
Radiance Of The Seas	C6SE7	Anchorage	24	26	19	36	20	6	1	1	8	57	0	0	198
Rebecca Lynn		Duluth	0	0	0	14	8	8	4	17	4	18	0	0	73
Regulus Voyager	C6FE6	San Francisco	36	3	10	3	2	0	20	13	0	24	0	0	111
Resolve	WCZ5535	Baltimore	28	25	21	14	36	3	47	45	40	28	0	0	287
Resolve	WDD7117	Kodiak	86	222	82	157	27	249	14	0	0	0	0	0	837
Rhapsody Of The Seas	C6UA2	Anchorage	0	0	0	0	0	0	3	20	10	2	0	0	35
Robert C. Seamans	WDA4486	Kodiak	0	0	0	0	0	5	48	3	0	44	0	0	100
Roger Blough	WZP8164	Duluth	0	0	0	23	54	0	37	34	30	3	0	0	181
Roger Revelle	KAOU	Los Angeles	7	13	51	60	75	65	44	30	23	14	0	0	382
Ronald H. Brown	WTEC	Charleston	40	47	66	10	0	0	0	0	0	0	0	0	163

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Ronald H. Brown (Aws)	NWS0018	Charleston	475	357	556	528	107	3	0	0	2	39	0	0	2067
Ronald N	A8PQ3	Anchorage	30	7	51	83	54	85	261	595	201	51	0	0	1418
Rtm Piiramu	2AMW7	Anchorage	4	2	1	0	0	0	0	0	4	6	0	0	17
Ryndam	PHFV	Miami	51	7	21	14	77	75	67	55	56	73	0	0	496
S.S. El Faro	WFJK	Jacksonville	0	0	0	0	0	0	18	66	53	52	0	0	189
S/R American Progress	KAWM	Valdez	11	8	8	5	17	72	2	1	74	11	0	0	209
S/R Wilmington	WBVZ	Miami	6	39	15	2	48	28	4	9	0	0	0	0	151
Safmarine Ngami	ONFC	Charleston	0	0	0	56	16	81	77	41	43	7	0	0	321
Saga Andorinha	MYNJ6	Anchorage	0	0	0	0	0	0	0	0	10	22	0	0	32
Saga Enterprise	VRCC8	Houston	78	0	0	0	0	0	0	0	0	0	0	0	78
Saga Frontier	VRCP2	Anchorage	41	3	12	8	15	49	4	100	56	117	0	0	405
Saga Navigator	VRDA4	Anchorage	0	8	15	55	1	0	4	0	0	0	0	0	83
Saga Viking	VRXO6	Anchorage	0	2	2	3	0	2	0	0	0	9	0	0	18
Saipem 7000	C6NO5	Anchorage	0	0	0	16	39	25	89	0	0	0	0	0	169
Salvia Ace	ZCXR	Jacksonville	6	25	3	28	35	26	25	2	33	21	0	0	204
Sam Laud	WZC7602	Duluth	0	0	0	0	0	8	55	43	7	0	0	0	113
Samson Mariner	WCN3586	Kodiak	2	0	0	2	0	0	0	0	3	2	0	0	9
Samuel De Champlain	WDC8307	Duluth	19	0	20	57	42	39	21	7	17	23	0	0	245
Sandra Foss	WYL4908	Kodiak	0	13	21	8	0	10	0	0	0	6	0	0	58
Saudi Abha	HZRX	Baltimore	50	31	1	35	43	3	44	53	8	15	0	0	283
Saudi Diriyah	HZZB	Houston	31	0	43	26	1	5	25	0	19	4	0	0	154
Saudi Hofuf	HZZC	Houston	24	22	21	0	10	11	0	9	7	0	0	0	104
Saudi Tabuk	HZZD	Houston	31	0	0	0	0	3	38	49	4	42	0	0	167
Schackenborg	ZCIH7	Houston	20	9	41	40	0	0	0	0	0	0	0	0	110
Sea Breeze	WBN3019	Jacksonville	0	0	0	0	0	0	13	45	70	51	0	0	179
Sea Hawk	WDD9287	Kodiak	19	29	0	0	0	0	12	10	34	1	0	0	105
Sea Horse	WBN4382	Jacksonville	0	0	0	0	0	21	66	5	4	0	0	0	96
Sea Prince	WYT8569	Kodiak	32	27	84	118	106	7	54	118	118	21	0	0	685

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Sea Robin	WYT8432	Kodiak	2	27	12	17	0	46	0	1	45	46	0	0	196
Sea Victory	WCY6777	Kodiak	0	0	0	0	0	1	0	0	0	0	0	0	1
Sea Voyager	WCX9106	Valdez	56	61	94	203	105	86	112	197	153	206	0	0	1273
Seabulk America	WWYY	Miami	7	16	25	26	14	34	35	17	0	0	0	0	174
Seabulk Arctic	WCY7054	Valdez	15	39	46	33	17	20	9	40	22	25	0	0	266
Seabulk Nevada	WCY2306	Anchorage	0	0	0	1	0	0	0	0	0	0	0	0	1
Seabulk Pride	WCY7052	Valdez	11	19	16	31	27	1	6	4	0	0	0	0	115
Seabulk Trader	KNJK	Miami	17	6	47	54	54	14	13	45	40	45	0	0	335
Sea-Land Champion	WKAU	Houston	67	43	20	29	55	7	47	47	44	63	0	0	422
Sea-Land Charger	WDB9948	Los Angeles	24	0	11	0	0	10	16	9	0	19	0	0	89
Sea-Land Comet	WDB9950	Los Angeles	66	51	83	94	42	5	21	12	43	52	0	0	469
Sea-Land Eagle	WKAE	Houston	75	140	59	44	33	97	66	50	118	139	0	0	821
Sea-Land Intrepid	WDB9949	Los Angeles	43	38	39	30	32	19	23	50	23	41	0	0	338
Sea-Land Lightning	WDB9986	Los Angeles	11	17	4	6	16	42	25	14	9	15	0	0	159
Sea-Land Mercury	WKAW	Houston	45	85	117	68	64	37	11	68	98	79	0	0	672
Sea-Land Meteor	WDB9951	Norfolk	46	33	28	26	34	13	28	47	29	25	0	0	309
Sea-Land Racer	WKAP	Houston	71	177	230	174	85	124	227	266	94	56	0	0	1504
Sedef Kalkavan	V7LU5	Norfolk	2	0	26	16	22	47	41	7	0	0	0	0	161
Sena Kalkavan	V7JH2	Norfolk	14	0	0	0	7	0	0	0	0	0	0	0	21
Senang Spirit	C6ME8	Anchorage	0	18	11	37	43	34	26	30	4	0	0	0	203
Seneca	WBN8469	Kodiak	0	0	0	0	4	71	35	25	38	27	0	0	200
Sentinel	WBN6510	Jacksonville	0	0	0	0	0	0	1	16	0	3	0	0	20
Sentinel	WDE6120	Anchorage	0	2	2	0	0	0	0	0	0	0	0	0	4
Serac	KF007	Anchorage	0	0	0	0	0	0	0	1	0	0	0	0	1
Serenade Of The Seas	C6FV8	Miami	0	0	0	0	0	14	23	16	3	18	0	0	74
Serenata	3EEE2	Anchorage	1	0	5	15	13	3	3	8	17	15	0	0	80
Sesok	WDE7899	Kodiak	0	0	0	0	4	0	2	0	0	0	0	0	6
Seven Seas Mariner	C6VV8	Anchorage	18	50	42	15	11	3	12	32	20	28	0	0	231

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Seven Seas Navigator	ZCDT7	Anchorage	0	0	0	0	67	19	2	0	19	18	0	0	125
Sheila Mcdevitt	WDE2542	New Orleans	20	16	39	59	52	83	40	0	4	62	0	0	375
Sidney Foss	WYL5445	Kodiak	4	10	28	25	8	14	0	0	0	0	0	0	89
Sierra	WSNB	Valdez	18	19	20	22	18	3	0	16	39	17	0	0	172
Sigas Silvia	S6ES6	Anchorage	0	3	6	16	8	5	3	1	0	0	0	0	42
Siku	WCQ6174	Kodiak	0	0	0	53	38	23	13	6	0	0	0	0	133
Sinuk	WCQ8110	Kodiak	0	0	0	44	213	233	231	135	169	122	0	0	1147
Siranger	9VAH	Anchorage	10	14	14	16	5	5	5	3	4	0	0	0	76
Sirius Voyager	C6FG9	Anchorage	25	0	0	0	0	0	0	0	0	0	0	0	25
Skanderborg	ZCIG4	Houston	29	11	41	0	0	0	0	0	0	0	0	0	81
Skodsborg	ZCIJ7	Baltimore	0	0	2	25	22	0	0	0	0	0	0	0	49
Snohomish	WDB9022	Kodiak	0	0	0	0	0	14	76	28	0	0	0	0	118
Snopac Innovator	WUU9229	Seattle	0	0	0	0	0	1	1	0	0	0	0	0	2
Soga	3FDR8	New York City	19	19	19	8	7	17	12	1	7	9	0	0	118
Sol Do Brasil	ELQQ4	Miami	26	5	26	15	23	32	36	29	38	52	0	0	282
Sp5. Eric G. Gibson	KNFG	Baltimore	0	0	0	0	0	0	0	5	75	30	0	0	110
Splendour Of The Seas	C6TZ9	Anchorage	120	59	49	25	23	129	169	124	117	105	0	0	920
SS El Morro	KCGH	Jacksonville	6	6	8	16	28	32	35	32	14	25	0	0	202
St Louis Express	WDD3825	Houston	312	334	497	406	272	246	338	450	257	139	0	0	3251
St Nicholas	WDB8066	Valdez	0	0	5	12	6	11	3	0	0	0	0	0	37
St. Clair	WZA4027	Duluth	0	0	0	23	4	89	86	84	74	55	0	0	415
Stacey Foss	WYL4909	Kodiak	0	0	0	0	0	11	0	0	0	8	0	0	19
Stadt Berlin	V2OH8	New York City	0	0	0	0	6	24	19	6	7	5	0	0	67
Stalwart	WBN6512	Valdez	15	20	42	46	19	15	42	36	43	49	0	0	327
Star Alabama	LAVU4	Baltimore	0	0	0	0	0	0	0	0	0	12	0	0	12
Star America	LAVV4	Jacksonville	60	55	39	0	41	0	6	38	16	19	0	0	274
Star Atlantic	LAYG5	Anchorage	87	111	47	56	83	43	48	68	108	97	0	0	748
Star Derby	LAXS2	Anchorage	8	0	0	31	0	24	28	35	32	36	0	0	194

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Star Dieppe	LEQZ3	Anchorage	27	28	0	10	2	0	0	31	30	17	0	0	145
Star Eagle	LAWO2	New Orleans	34	34	17	33	33	23	11	41	4	54	0	0	284
Star Evviva	LAHE2	Jacksonville	0	6	0	0	0	41	10	32	4	19	0	0	112
Star Florida	LAVW4	Jacksonville	45	3	42	32	21	6	28	0	9	24	0	0	210
Star Fraser	LAVY4	Anchorage	0	45	26	69	51	66	55	17	52	213	0	0	594
Star Fuji	LAVX4	Charleston	0	0	0	0	0	6	0	3	12	11	0	0	32
Star Gran	LADR4	Los Angeles	0	7	0	38	17	39	51	25	41	33	0	0	251
Star Grip	LADQ4	Charleston	57	14	0	0	5	9	25	11	39	5	0	0	165
Star Hansa	LAXP4	Jacksonville	12	0	41	9	21	4	67	42	43	0	0	0	239
Star Harmonia	LAGB5	Baltimore	0	0	0	12	5	9	3	23	16	1	0	0	69
Star Herdla	LAVD4	New Orleans	24	0	32	17	34	20	49	34	77	39	0	0	326
Star Hidra	LAVN4	Baltimore	37	20	35	30	36	27	25	47	23	11	0	0	291
Star Isfjord	LAOX5	New Orleans	19	23	17	11	13	21	31	19	32	0	0	0	186
Star Ismene	LANT5	Baltimore	10	15	17	19	14	15	23	28	13	16	0	0	170
Star Istind	LAMP5	Houston	19	6	19	32	30	2	16	10	18	0	0	0	152
Star Japan	LAZV5	New Orleans	35	26	59	33	27	29	12	23	23	15	0	0	282
Star Java	LAJS6	Baltimore	0	0	27	36	6	23	25	14	47	48	0	0	226
Star Juventas	LAZU5	Baltimore	10	0	0	0	0	0	0	0	0	0	0	0	10
Star Kinn	LAJF7	Anchorage	0	0	0	0	0	0	0	0	0	75	0	0	75
State Of Maine	WCAH	New York City	0	0	0	0	65	49	0	0	0	0	0	0	114
Statendam	PHSG	Miami	12	0	23	28	15	23	62	35	16	8	0	0	222
Stellar Eagle	V7RJ6	Anchorage	13	11	2	15	12	14	16	6	6	5	0	0	100
Stellar Sea	KGCJ	Kodiak	3	1	0	2	3	1	2	0	0	0	0	0	12
Stellar Voyager	C6FV4	Seattle	0	0	0	23	1	5	11	33	41	25	0	0	139
Stewart J. Cort	WDC6055	Duluth	0	0	0	0	45	51	61	47	46	54	0	0	304
Stimson	KF002	Kodiak	44	44	14	15	54	36	69	0	0	0	0	0	276
Sunshine State	WDE4432	Miami	25	20	24	11	8	7	35	66	34	38	0	0	268
Superstar Aquarius	C6LG6	Miami	26	27	31	14	31	30	31	31	33	37	0	0	291

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Superstar Libra	C6DM2	Anchorage	0	0	0	0	13	117	121	109	196	146	0	0	702
Sylvie	VRCQ2	Anchorage	23	12	0	0	0	0	8	5	6	0	0	0	54
Taku	WI9491	Kodiak	0	0	0	0	0	0	0	1	0	0	0	0	1
Talisman	LAOW5	Jacksonville	2	19	40	26	3	16	29	22	2	29	0	0	188
Tama Star	C6MA6	New Orleans	13	0	0	0	0	0	0	0	0	0	0	0	13
Tamesis	LAOL5	Norfolk	0	0	10	38	36	38	5	17	20	12	0	0	176
Tan'erliq	WCY8497	Valdez	0	0	0	0	0	1	0	0	0	0	0	0	1
Taurus	WYH6499	Kodiak	0	0	0	0	0	0	0	0	0	1	0	0	1
Thomas G. Thompson	KTDQ	Seattle	32	28	2	35	13	11	10	0	4	0	0	0	135
Thomas Jefferson	WTEA	Norfolk	0	0	0	0	0	3	26	35	13	11	0	0	88
Tiglax	WZ3423	Anchorage	0	0	0	0	3	9	2	6	6	0	0	0	26
Tim S. Dool	VGPY	Duluth	0	0	0	0	0	0	0	1	4	1	0	0	6
Tina Litrico	KCKB	New Orleans	0	0	28	10	60	16	19	4	41	6	0	0	184
Titan	WAW9232	Kodiak	0	0	0	0	0	2	0	0	0	0	0	0	2
Tordenskjold	WB3888	Kodiak	0	0	0	0	0	0	0	3	0	0	0	0	3
Torm Esbjerg	VREQ5	Anchorage	37	13	15	27	18	44	3	0	0	0	0	0	157
Tower Bridge	C6TF8	Anchorage	0	0	0	0	0	0	0	0	63	57	0	0	120
Triumph	WDC9555	Kodiak	0	0	0	0	0	0	0	3	0	0	0	0	3
Tropic Carib	J8PE3	Miami	13	2	0	0	0	1	0	1	15	13	0	0	45
Tropic Jade	J8NY	Miami	13	10	11	16	15	10	8	9	13	23	0	0	128
Tropic Lure	J8PD	Miami	3	1	0	0	1	0	0	0	4	17	0	0	26
Tropic Night	J8NX	Miami	10	16	15	11	10	10	4	0	10	15	0	0	101
Tropic Opal	J8NW	Miami	22	23	32	19	31	37	33	43	41	41	0	0	322
Tropic Palm	J8PB	Miami	14	0	6	6	7	9	7	8	12	11	0	0	80
Tropic Sun	J8AZ2	Miami	8	34	53	13	8	8	5	14	9	21	0	0	173
Tropic Tide	J8AZ3	Miami	36	23	33	27	36	29	37	15	21	7	0	0	264
Tropic Unity	J8PE4	Miami	8	17	18	0	0	0	0	0	0	0	0	0	43
TS Kennedy	KVMU	New York City	61	54	0	0	0	0	0	0	0	0	0	0	115

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Tug Dorothy Ann	WDE8761	Duluth	2	0	0	2	2	10	6	13	0	0	0	0	35
Tustumena	WNGW	Kodiak	56	126	4	164	167	208	252	168	200	235	0	0	1580
Tuxedni	WDC8084	Kodiak	0	0	0	0	1	0	0	1	0	0	0	0	2
Tyco Decisive	V7DI7	Baltimore	28	0	0	0	6	10	0	0	0	0	0	0	44
Tyco Durable	V7DI8	Baltimore	58	7	42	26	12	7	21	2	0	0	0	0	175
Tyco Responder	V7CY9	Baltimore	0	0	39	27	51	10	13	69	2	41	0	0	252
Tycom Reliance	V7CZ2	Baltimore	0	0	0	0	0	0	27	0	0	0	0	0	27
UBC Saiki	P3GY9	Seattle	93	34	41	70	55	65	76	54	82	41	0	0	611
UBC Santa Marta	5BDK2	New Orleans	0	20	9	7	44	74	91	114	93	107	0	0	559
Umang	A8PF6	Anchorage	0	0	0	0	0	18	17	42	48	30	0	0	155
Unique Brilliance	VRXK4	Anchorage	27	34	74	11	22	14	12	21	12	20	0	0	247
Unique Carrier	VRCV5	Anchorage	105	72	34	49	60	19	102	90	50	34	0	0	615
United Spirit	ELYB2	Seattle	67	96	61	11	52	59	0	21	72	9	0	0	448
USCG Alder	NGML	Duluth	0	0	0	0	0	0	1	0	0	0	0	0	1
Valdez Star	WCO7674	Valdez	0	0	0	0	0	0	0	0	1	0	0	0	1
Veendam	PHEO	Miami	35	39	30	22	44	35	45	23	63	176	0	0	512
Vega Voyager	C6FV3	Anchorage	11	56	30	35	46	20	36	4	6	1	0	0	245
Vigilant	WDE2719	Kodiak	26	54	21	37	45	30	58	56	56	64	0	0	447
Viking Star	WDE6434	Kodiak	2	0	0	0	0	4	0	0	0	1	0	0	7
Virginian	KSPH	Houston	53	39	71	82	82	89	37	60	85	74	0	0	672
Vision Of The Seas	C6SE8	Miami	8	52	60	15	2	5	0	0	2	2	0	0	146
Volendam	PCHM	Anchorage	519	558	678	472	291	538	623	629	426	531	0	0	5265
Voyager Of The Seas	C6SE5	Miami	30	0	3	6	39	33	93	90	45	30	0	0	369
Walter J. Mccarthy Jr.	WXU3434	Duluth	0	0	0	0	0	7	1	0	0	2	0	0	10
Warrior	WBN4383	Kodiak	0	0	0	0	0	0	91	79	0	0	0	0	170
Washington Express	WDD3826	Houston	61	74	130	125	106	91	80	95	119	61	0	0	942
Washington Voyager	KFDB	San Francisco	0	8	25	34	30	94	44	20	19	40	0	0	314
Wave Runner	WSK2703	Kodiak	0	0	4	0	0	0	0	0	0	0	0	0	4

Ship Name	Call Sign	PMO	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Wecoma (Aws)	NWS0002	Kodiak	0	0	564	180	162	118	141	396	361	268	0	0	2190
Westerdam	PINX	Miami	498	320	255	161	102	230	132	100	55	78	0	0	1931
Westward Venture	KHJB	Jacksonville	7	19	26	3	0	0	2	0	0	0	0	0	57
Westwood Columbia	C6SI4	Seattle	14	22	0	0	0	0	16	20	43	35	0	0	150
Westwood Olympia	C6UB2	Seattle	0	7	7	18	40	2	0	30	36	43	0	0	183
Westwood Rainier	C6SI3	Seattle	4	0	22	24	34	43	27	28	20	44	0	0	246
Wilfred Sykes	WDA2769	Duluth	0	0	0	365	672	693	486	0	190	721	0	0	3127
Woldstad	KF001	Kodiak	12	11	16	21	18	16	19	0	0	15	0	0	128
World Spirit	ELWG7	Seattle	0	13	20	31	28	15	23	44	60	60	0	0	294
Xpedition	HC2083	Anchorage	0	0	0	0	39	22	32	23	0	0	0	0	116
Ym Antwerp	VRET5	Anchorage	19	13	26	49	23	28	24	33	41	33	0	0	289
Ym Busan	VREX8	Anchorage	121	149	425	563	334	20	50	81	33	59	0	0	1835
Yorktown Express	WDD6127	Houston	51	34	48	31	28	53	55	52	44	35	0	0	431
Yuhsan	H9TE	Anchorage	5	10	11	2	12	0	0	10	18	2	0	0	70
Zaandam	PDAN	Anchorage	27	38	17	7	0	23	14	14	19	43	0	0	202
Zim Djibouti	A8SI4	Seattle	16	60	29	29	45	8	35	22	17	44	0	0	305
Zim Los Angeles	A8SI3	Seattle	1	0	8	0	0	26	17	52	20	26	0	0	150
Zim Ningbo	A8SI5	Seattle	9	4	4	14	11	22	44	19	37	0	0	0	164
Zim San Diego	A8SI7	Seattle	0	11	24	35	1	0	0	0	0	12	0	0	83
Zim Shanghai	VRGA6	New York City	17	14	11	6	19	10	8	13	20	13	0	0	131
Zuiderdam	PBIG	Anchorage	86	130	142	122	78	180	306	44	90	178	0	0	1356

			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Total Ships Reporting:	848	**Totals:**	26,171	27,466	33,447	34,062	36,383	34,607	40,476	40,679	40,105	38,474	0	0	351,860

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